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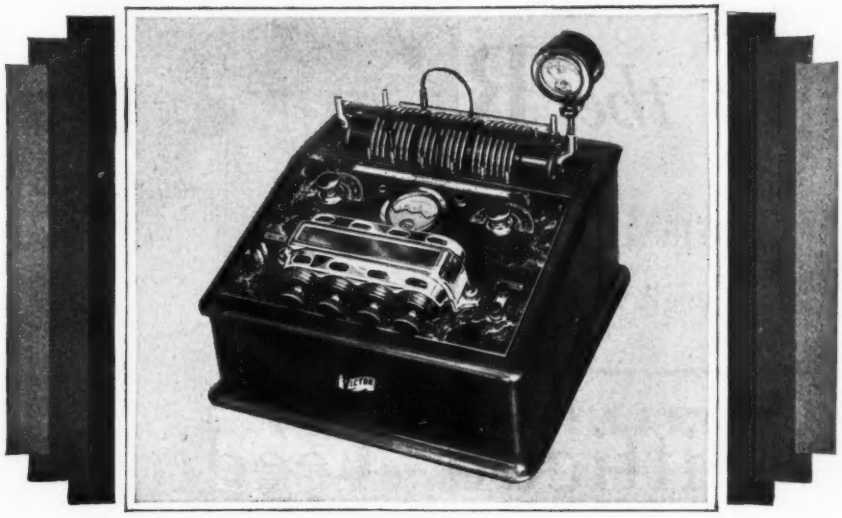

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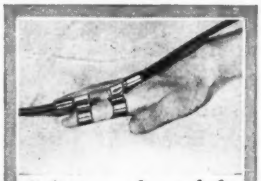

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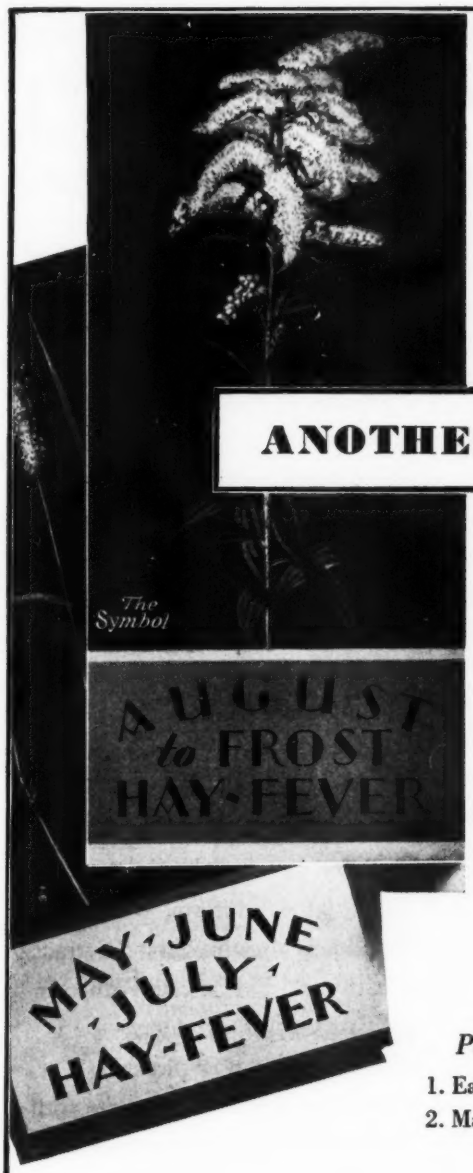

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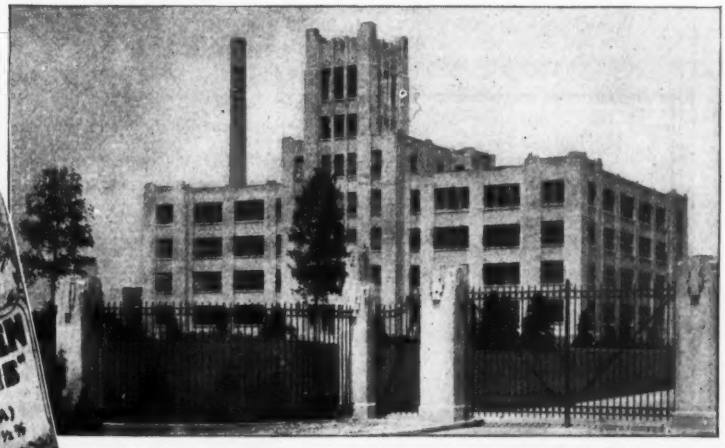

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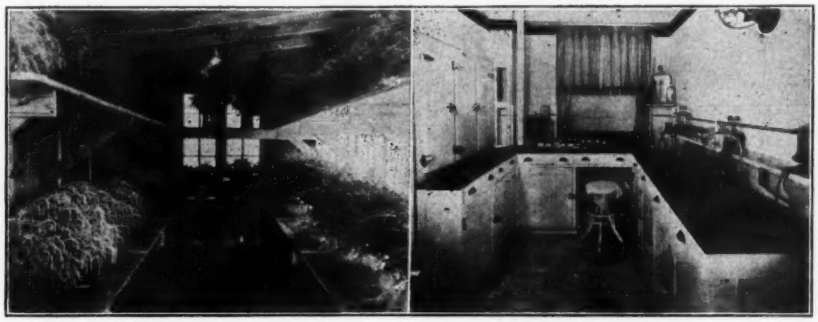

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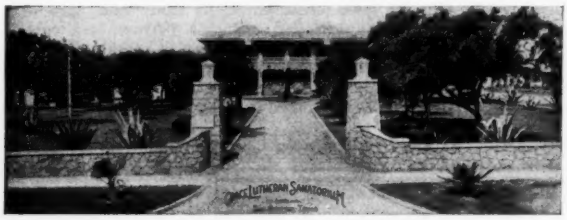

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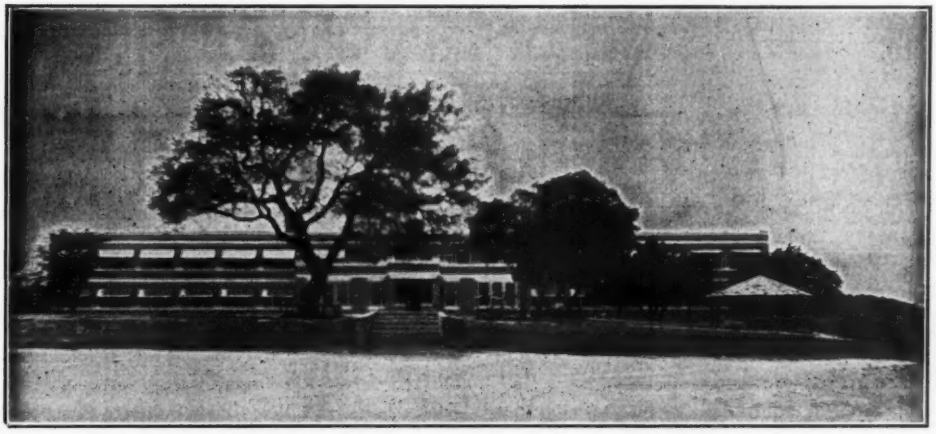

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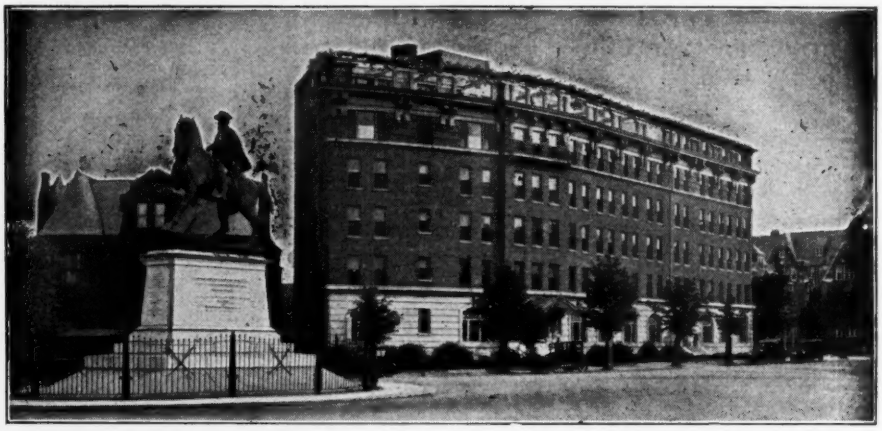

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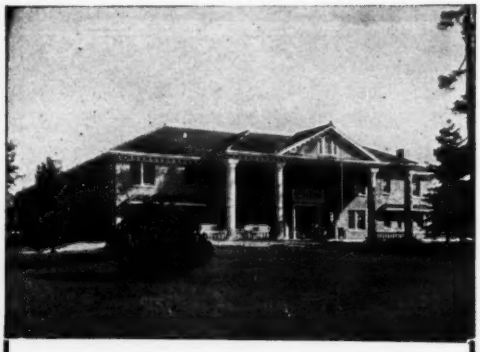

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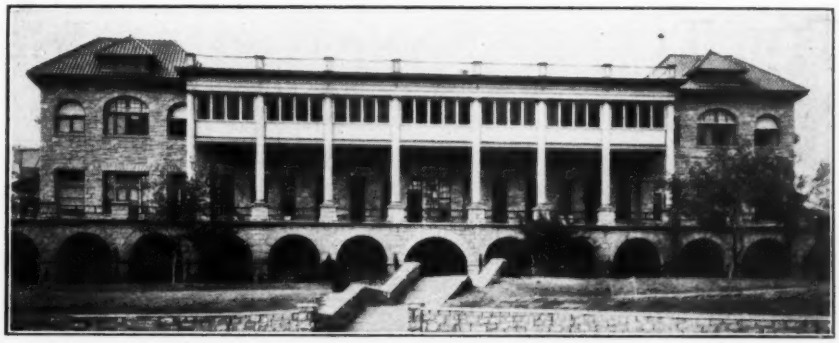

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ARTHRITIS DEFORMANS*

DIAGNOSIS, TREATMENT AND REHABILITATION

By WILLIAM S. BAER, M.D.,†
Baltimore, Md.

I am bringing this subject before you today to make clear, if possible, the differentiation between the various types of arthritis deformans. We are speaking very loosely at present when we use the term arthritis deformans, and probably we are dealing with more than one disease. It is necessary for us to differentiate carefully the various types; for the therapeutic remedies needed for the cure of these types are very different. We must also understand that when we have cured the disease we have not cured the patient. Rehabilitation of the various joints has to be accomplished before he can be returned to his normal activity.

For therapeutic purposes arthritis deformans may be divided into three classes: (1) arthritis deformans of the infectious type; (2) arthritis deformans of the atrophic type; (3) arthritis deformans of the hypertrophic type. Let us take up these three classifications separately, look at them from a pathological, clinical and an x-ray point of view, and discuss the means of treatment and the rehabilitation of patients belonging to each group.

ARTHRITIS DEFORMANS OF THE INFECTIOUS TYPE, OR CHRONIC PROGRESSIVE ARTHRITIS

Clinically, this is a disease primarily of young people. We find it in children as so-called Still's disease, and also in older people, particularly about the time of menopause, but it generally comes on at the time of puberty. Among its manifestations is a swelling of various joints. There is an increase of fluid in the knee joints, a round cell infiltration of the fibrous lining of the joint (capsule), a hypertrophy of the synovial membrane, and some fibrin formation at times within the joint itself. Owing to the round cell infiltration, contractions of the ligaments and tendons about the joint take place. The joint itself becomes swollen, as a result of the fluid and hypertrophy of synovial membrane, in a symmetrical manner. The swelling is soft, and when it occurs in the fingers it generally attacks the middle phalangeal joints and a pear-shaped deformity is the result. If it attacks joints, for instance the spine, a slight amount of new bone formation may occur at the attachment of the lateral or anterior ligament to the spine. The swelling in the joints is fluid in character and of a tension that only fluid or hypertrophied synovial membrane can give. As a rule, no new bone formation is in these joints. The clinical picture is definite and positive. The disease comes on primarily in younger people, generally following some infectious process in the body. It may occur in children as Still's disease, or later in life following grippe, nasal, pelvic and other infections. In these cases there may be a slight fever, both general and local, although the amount of local temperature elevation is extremely mild. One recognizes very early the swelling within the joint, and readily can determine if that swelling is soft in character, like fluid not under great pressure, or synovial membrane pads. In the hands, therefore, we have the typical Hogarth node. Curiously enough, when the swelling begins in the hand it almost invariably begins in the middle phalangeal joint. The knuckles then may become involved, but rarely ever are the distal phalangeal joints of the fingers a part of the process. In the knee joint we have a similar expression, which is that of fluid and thickened synovial membrane. This may go on to involvement of the ankles, the hips, shoulders, temporomaxillary and other joints. At times the spine, and spine alone, may be involved in

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†Clinical Professor of Orthopedic Surgery, Johns Hopkins University.

Fig. 1-A Fig. 1-B Fig. 1-C
Fig. 1-A. Arthritis deformans of the atrophic type.
Fig. 1-B. Arthritis deformans of the hypertrophic type.
Fig. 1-C. Arthritis deformans of the infectious type.

the process with slight new bone formation and marked stiffening of the back which results in a loss of the normal spinal motions. Occasionally, as in the Marie Struempell type of the disease, not only do we get a loss of motion in the spine, but also the shoulders and hips may become involved in the process. On moving the joint, particularly the knee joint, a definite soft purring sound may be heard by auscultation, and even felt by manual examination. This purring, which is due to synovial membrane rubbing, is entirely different in sound from that which one gets in the hypertrophic type of arthritis deformans.

The blood picture in a case of arthritis deformans of the infectious type shows very little change from the picture of normal blood except that the leucocyte count is raised slightly in most cases, there is a mild grade of secondary anemia, and the polymorphonuclear leucocytes are slightly increased at the expense of the lymphatic elements.

The x-ray picture is rather characteristic. There is an appearance of fluid, the joint is distended, and the shadows are changed by the thickening of the synovial membrane. There is some atrophy of the bone, particularly in its epiphyseal portions, so that a slight osteoporosis has taken place and this porosis is probably due to the lessened activity of the part. Small spurs are often found at the attachment of ligamentous or tendinous structures within the joint, as on the tibial spines in the knee, and at the attachment of the quadriceps muscle and patella tendon to the patella. In joints like those of the spine, small spurs are evident at the attachment of the ligamentous structures to the sides of the vertebral bodies. In general, therefore, the diagnostic picture is one of a joint swollen by fluid, having a definite tension due to that fluid, or to thickened synovial membrane, and a slight local elevation of temperature associated with contractions always in flexion.

The treatment of arthritis deformans of the infectious type should be aimed first at stopping the infectious process, and after the infectious process has been overcome then, and then only, should methods of repair and restoration of joints be instituted. Before taking up the question of treatment the etiological factors in the production of this type of arthritis deformans must be considered. There are, of course, many views upon this matter. Some believe that it is entirely a digestive condition. Others believe that it is due to a disturbance of the internal secretions. Others believe that it is entirely an infectious process. Some think that the infection is caused by a parasite, amebic in character; others that it is caused by bacterial invasion. After sifting the various theories and the evidence which has been brought forward in substantiation, I think one can hardly get away from the fact that bacteria in one form or another cause the trouble. The question of whether there is a specific organism for arthritis deformans of the infectious type cannot yet be definitely answered, although the more we study the disease the more it is borne in upon us that its course is like that of the diseases caused by micro-organisms.

One organism after the other is being eliminated. Most of us now believe that some form of streptococcus is the etiological factor, and the evidence is growing daily that it is a non-hemolytic streptococcus. The organism gets into the tissues, probably through the blood, and may lodge in some organ from which it cannot readily escape. The local focus of infection may be in the frontal sinuses, the ethmoids, sphenoid, tonsils, teeth, the middle ear, the chest, the gall bladder, the appendix, the gastro-intestinal tract, the kidneys, the ovarian tubes, the bladder, or in other inaccessible parts of the human body. These organisms are carried by the blood to the various joints and they set up pathological changes in the fibrous tissue of the joints and in the synovial membrane, and may later go directly into the joint itself, from which they

may be captured by aspiration. I am inclined to think that there must be something else in the body which combines with the streptococcus to cause arthritis deformans of the infectious type, and it is well to express it in some such manner as this: infection plus X, equals arthritis deformans of the infectious type. What X is at the present time we cannot answer. We may express it by saying that X is heredity, for we know that many people are invaded by the streptococcus who do not get arthritis deformans. If there is no specific organism, then something within the body must combine with the streptococcus to form the disease. X may be an internal secretion which is pathological, or X may be some mal-adjustment of the chemistry of the body. If we remove the bacterial part of the equation then whatever X may be, arthritis deformans of this type cannot be produced.

The treatment, therefore, of arthritis deformans is obvious. We must do away with the bacteria that are producing the disease. At first, after a proper diagnosis has been made, the human body is subjected to a careful examination so that the state of each organ and each cavity may be ascertained, just as a merchant takes an inventory of the stock which he has in his warehouse. This, of course, demands the cooperation of many medical men, for no one person is sufficiently trained to examine the human body in its entirety. Nor can such an examination be made in any one office. I find that the best results are obtained after a four-day examination in a hospital where laboratory facilities of the highest order are present and where one can call upon his colleagues for assistance in all lines of investigation. The patient should be examined, first by the laryngologist, who reports carefully and accurately on the condition of the nose, throat, sinuses and ears. The internist reports especially whether there is chronic bronchitis, bronchiectasis, abscess of the lung or abscesses along the mediastinum, for I feel that in certain cases, particularly in children, an abscess from a broken down gland or an abscess in the lung is often the seat of the infection. The dentist carefully goes over the teeth, guided by the x-ray examination, and makes his report as to the presence of any abscesses in that region, although at the present day I believe that owing to a lack of complete study many teeth are sacrificed which would be most useful in proper mastication if they had been left alone. The gastro-enterologist with his various means of examinations, including the study of stools, the fluoroscopic examination of the intestines and a complete gastro-intestinal series, as well as the study of the gall bladder, aids us materially in making a positive or negative diagnosis of conditions within his field. The urologist gives us an accurate picture of the function of the kidneys, of the condition of the bladder, and of the prostatic gland. The gynecologist determines for us whether the tubes are involved, the condition of the bladder in the female, and the presence or absence of an endocervicitis. Further laboratory examinations are made: a complete urinary analysis, and blood examination, both a Wassermann and differential blood count. Blood cultures are taken to find out whether there is an organism in the blood; the amount of blood sugar is estimated, as well as the uric acid. The basal metabolism test is made. Phenolphthalein tests for kidney function are made. It is evident, therefore, from the numerous examinations which have to be made, and their nature,

Fig. 2
Synovectomy of left knee. Oil injection of right knee. Arthritis deformans of the infectious type (left, sitting; right, standing).

Fig. 3
Arthroplasty of jaw for infectious arthritis (left, before operation; right, after operation).

that hospitalization is required until they are completed.

But these examinations alone are not sufficient. The disease which started as a local infection has now become constitutional, involving many joints as well as ligamentous, fibrous and muscular tissues. It does not suffice, therefore, simply to remove the local focus of infection. It is necessary to combat and overcome the constitutional involvement. We must find out just what organism we are dealing with. How may this be done? We are aware, of course, that we may obtain the organism from the local focus of infection if we succeed in finding the focus. The removal of the local focus alone is not followed by the recovery of the patient since the trouble has become constitutional. If the organism is obtained from some cavity which is absolutely walled-off from the outside, one may obtain it in pure culture; but examination of most parts of the human body gives us many organisms. Especially is this true in a bacteriological study of the intestinal flora, the teeth, and tonsils. It is difficult, therefore, to be sure that one has found the organism which is the cause of the trouble. It has been our custom to try to obtain it in pure culture. It has been recovered in pure culture on a few occasions from the blood; it has been recovered in pure culture in small numbers directly by aspiration of the joint involved.

Lymph Node Culture.—The organism may be obtained in pure culture most often from the lymphatic system. The lymphatic system, together with the lymph nodes, is the sewerage system for bacteria in the human body. In 1914 Rosenow pointed out that if cultures were made directly from the lymph nodes, organisms could be obtained in many instances. The ordinary organism which affects the human body acutely, the staphylococcus, streptococcus, Welch bacillus, dies out very rapidly in the lymphatic system. From a series of cultures of lymph nodes of so-called normal individuals and individuals with acute infections, such as osteomyelitis, tonsillitis, or tuberculosis, we were able to recover an organism in less than ten per cent. On the other hand, we have proven that in about 66 per cent of all cases of arthritis deformans of the infectious type an organism in pure culture can be obtained. Of the 66 per cent thus obtained 85 per cent of the organisms were non-hemolytic streptococci, 10 per cent were hemolytic streptococci, and the other 5 per cent were diphtheroid organisms, which are probably non-pathogenic, and there were a few of *staphylococcus albus* or *aureus*. We have, therefore, by the removal of the node under perfectly aseptic technic, been able to recover an organism in pure culture which is probably one element in the etiology of arthritis deformans of the infectious type. It is not easy to obtain these organisms. They do not grow rapidly. They are extremely persistent in the node, but it takes a tenacious and persevering bacteriologist to recover them. I should say that an average period necessary for the growth of the organism from a lymph node is at least ten days. There are many which cannot be demonstrated for three weeks, and in one case, at least, it was six weeks before the organism grew. Not many bacteriologists have the tenacity and steadfastness of purpose to continue to incubate or cultivate the culture for this period of time. The average bacteriologist, at the end of forty-eight or seventy-two hours, if he sees no growth consigns his material to the refuse jar.

Cultivation of the lymph node is a method of obtaining the organism in pure culture in 66 per cent of the cases. In the other 34 per cent our bacteriological methods may be still too crude, or the infection may have burned itself out on account of the length of time the patient has been suffering with arthritis deformans, or

the organism may by this time be so attenuated as to be beyond revivification. If a culture is isolated an autogenous vaccine may be made which will later be used in the treatment of the disease. The method of preparing this vaccine is as follows:

Technic of Lymph Node Culture.—One goes over the lymphatic system of the body and removes a lymph node; be it cervical, axillary, inguinal, or epitrochlear, which is nearest the joint which seems at that time to be most acutely infected. The node is, of course, removed under perfectly aseptic technic. Immediately on removal it is taken to the laboratory for culture. It is removed from its container with sterile forceps, flamed, and placed in the container in which it is to be macerated. A Rosenow tissue crusher is ideal for this purpose as it is simple to use and easily sterilized. After the maceration of the node about 5 c. c. of beef extract broth are added to it. The resulting emulsion is then used to inoculate the various media. The culture media in all cases is dextrose ascitic fluid agar. The Carrel tube with dextrose ascitic fluid agar, blood agar, Loeffler's medium, brain veal agar, beef extract broth both alone and with ascitic fluid, and beef heart infusion were the principal media tried. The inoculation of the Carrel tube with dextrose ascitic fluid is done as follows: the dextrose agar tubes are placed in a container of hot water, the water brought to a boil and kept boiling vigorously for fifteen minutes after the agar has melted in order to drive off the oxygen. Occasional shaking of the boiling tube helps to get rid of the oxygen. In each of the two tall sterile culture tubes are placed 3 to 4 c. c. of sterile ascitic fluid. One cubic centimeter of the emulsion is added to the ascitic fluid in one tube and in the other tube is placed the remains of the macerated gland. The melted dextrose agar which has been cooled down to about 40 degrees is then poured into each tube until the tubes are two-thirds full. The sealing with sterilized vaseline makes the conditions more anaerobic. The piece of gland tissue renders the condition more favorable for anaerobes.

Preparation of Vaccine.—After the organism has been obtained in pure culture, numerous tubes of various types of agar are inoculated with it. After a sufficiently heavy growth appears, usually within thirty-six to forty-eight hours, it is washed off with sterile salt solution. This suspension is then standardized to contain one thousand million organisms per cubic centimeter, after which it is sterilized by heating at from 56 to 64° C. Tests are made on blood agar to determine whether the vaccine is sterile.

To ascertain whether the vaccine thus made from node culture has a specificity for the particular patient from whom the organism was obtained a sensitization test on the skin is made. A vaccine is made by killing the live organisms by boiling. In the 34 per cent of cases in which we are unable to obtain an autogenous organism from the lymph node, a vaccine is prepared from skin sensitization tests made on the individual. At all times strains of hemolytic and non-hemolytic streptococci are kept in the laboratory. These cultures have been obtained by the method described from patients who have suffered from arthritis deformans and have responded to the vaccine treatment. If, therefore, no culture is obtainable from the lymph node the patient's sensitivity to these various strains is ascertained, and a vaccine is prepared for him from the organisms to which he gives a skin reaction.*

Treatment of Arthritis Deformans of the Infectious Type.—The treatment of arthritis deformans of the infectious type consists first of

*I am indebted to the Laboratory of Drs. Baetjer, Miller and Rowe; to the Laboratory of Dr. Harold L. Amos, of the Johns Hopkins Hospital, and especially to Miss Poston, of that Laboratory; also to Miss Elizabeth Knight, of the Laboratory of the Children's Hospital School, for the bacteriological work and the making of the vaccines.

Fig. 4

Left hip.—Arthritis deformans of the infectious type (before operation).

Arthroplasty of left hip for arthritis deformans of the infectious type (after operation).

the eradication of the focus of infection. If the focus of infection can be found and if it is amenable to a surgical procedure, that method is used to get rid of it; or if it is amenable to medical treatment, medical treatment is used as a second means. If the tonsils are involved they may be removed. If the nose and throat are involved, or the sinuses, they should be operated upon. If there is an abscess of the lung which can be reached surgically, that method is preferable. If we are sure the focus of the disease is in the gall bladder, the gall bladder should be removed. If there is an abscessed kidney the kidney should be removed. Likewise, disease of the tubes and cervix should be treated surgically.

If, on the other hand, one encounters the organism in the intestinal tract it should be treated medically by antiseptics, high rectal irrigations, and other measures. If the prostate is the seat of the trouble, prostatic massage should be instituted. If the focus of infection cannot be found, or if it cannot be properly treated either surgically or medically, then vaccine therapy should be used, for this will counteract the constitutional disease with which we are dealing. The autogenous vaccine described is best. When no organism is found in the lymph node, vaccine therapy may still be used from an organism obtained by sensitization.

The mode of treatment is to begin with 0.1 c. c. of a one hundred million per cubic centimeter solution of the vaccine. The dosage should then be increased 0.1 c. c. every fourth day, so that the first dose should be 0.1 c. c., the second 0.2 c. c., four days later; third dose, 0.3 c. c. four days later, and so on. This should be kept up until the patient has had from twelve to sixteen doses. If the reaction is considerable, one should wait a few days and begin again with a smaller dose. After the course of fifteen doses has been given one rests for a period of about six weeks, when a second series is given similarly. In a few cases it will be necessary to give a third series. One always strives for a definite constitutional reaction of malaise, headache, and even a chill, and I am rather prone to push the dosage higher than I have indicated.

As for constitutional treatment, the patient should live in the open air and be put on forced feeding with no restriction of diet whatsoever. As in tuberculosis, the more we build up the body by properly stoking the furnace the quicker will be our recovery. Heliotherapy plays an important part in stimulating the activities of the body. Patients should not be restricted in their exercise. If possible, they should not be confined to bed. Passive motion to their joints should be carried out and they should be encouraged to walk as much as possible. Osler's saying that a trained nurse is the worse thing on earth for an arthritic of this type is very true.

One should avoid every kind of thermotherapy, hydrotherapy, electrical treatment, and diathermy in the acute stages before the disease has been thoroughly conquered. Naturally, one should use splintage and extension to overcome a tendency to contraction, and to prevent deformity. We do not claim that this method of treatment by eradication of focus and vaccine therapy will cure every case, but we would say that 75 per cent of the patients so treated have given the most gratifying results and so impressed are we with the improvement that we believe the method should be given a much more extensive trial.

Rehabilitation.—Rehabilitation differs from the treatment of the acute disease. No steps, except the prevention of deformity, should be attempted in rehabilitation until the disease has been conquered. Attempts to improve mobility and correct deformity will be of no use and may do harm during the acute stage. The character of rehabilitation depends upon the amount of deformity, the pathological changes which have occurred within the joints, and the absence of all active foci. When the disease has been overcome, in case of spondylitis, if the back has not become entirely ankylosed, an attempt should be made to straighten the flexed spine. This is best done by means, first, of hyperextension under anesthesia with repeated plaster casts. After the back has been fairly straightened, a removable brace, either of the Taylor or Bennett variety, should be used and gradual exercises should be given to increase the power of the weakened erector spinae, quadratus lumborum and latissimus dorsi muscles. It is remarkable how much straightening can be accomplished if the case has not been allowed to go on to complete ankylosis. In cases where joints are involved the method of rehabilitation depends upon the amount of involvement. If the involvement is of a minor character the joints will spontaneously clear up after removal of the focus of infection and vaccine therapy. If contractures are present, extension may be needed to overcome the changes which have taken place in the tendons and in the muscles. Thermo-

therapy, hydrotherapy, whirl-pool baths, active and passive massage, will aid in restoring the joint to its normal function. Definite exercises should be given to build up muscular strength. If the synovial membrane has been very much thickened and fibrously changed, owing to the round cell infiltration, injection of oil under anesthesia with passive motion should be given. If the thickness of the synovial membrane is great, the best method of treating such a joint as the knee is by means of a complete synovectomy. The results in these cases are astonishing. If the joints have gone on to a bony ankylosis, owing to destruction of cartilage by the inflammatory condition, arthroplasties will have to be done to regain the lost mobility. This is especially true in ankylosis of the jaw, ankylosis of the hip and ankylosis of the elbow.

One word of caution is necessary in regard to anesthesia in arthritic cases, either acute or chronic. Arthritis deformans being a constitutional disease, the fibrous structures of the body are most involved and the expansion of the lung, associated, at times, with a dry pericarditis, makes the use of nitrous oxid dangerous. The cases of arthritis deformans which I have lost under anesthesia have been only those to whom nitrous oxid was given.

ARTHRITIS DEFORMANS OF THE ATROPHIC TYPE

The pathology of arthritis deformans of the atrophic type differs from that of the infectious type in that the lesions are more severe. In this type the essential feature is atrophy; atrophy of bone, atrophy of muscle, atrophy of cartilage, finally leading to ankylosis, an ankylosis that simulates a synostosis rather than an ankylosis produced by new bone formation. As a rule, the synovial membrane entirely disappears, the cartilage is eroded, and one bone fuses into the other. The atrophy of the bone is so great that if a radiographic picture is made one finds an elimination of all joint spaces and the density of the bone has been so done away with that one can scarcely distinguish bone from the surrounding soft parts. Clinically, the disease may start as a special entity, or it may be the end result of an infectious type of arthritis deformans. I should say that the atrophic type of arthritis deformans is the end result of the infectious type in 90 per cent of the cases not treated.

In 10 per cent of cases the true atrophic type is present from the onset without the swelling of the synovial membrane or the typical picture of a Hogarth's nodosity. There is a quick and rapid destruction of tissue with atrophy accompanied with dislocation or ankylosis, and instead of the ordinary flexion deformities which one gets in the infectious type one gets bony ankylosis, but always in a position of hyperextension, particularly in the hand. Why this should be is uncertain. Perhaps, as has been suggested, a neurological element comes into play and the joint is affected by the action of the virus on the central nervous system. Atrophic arthritis generally follows infectious arthritis, just as locomotor ataxia is generally followed, but not preceded, by the Charcot joint.

The etiology of the atrophic type is probably the same as that of the infectious type, and the same organisms are found as in infectious arthritis except that they are far less numerous. Instead of being able to obtain the organism from the lymph node in 66 per cent of cases we find it in 5 per cent of cases. The fire has burned itself out and has left the machinery a complete ankylosed wreck, and the lymph nodes themselves have dwindled back to normality because the bacteria within them have been destroyed. From a clinical point of view, therefore, there is no enlargement of joints but a depression around each joint where the swelling formerly was. The joints are distorted, dislocated and ankylosed in vicious positions. There is no fever, and apparently no activity. The atrophy is extreme, of muscle and fibrous structures. The patients are, for the most part, unable to be active and are confined to bed or chair. Fortunately, the number of these cases in the last ten or fifteen years has greatly diminished and almshouses, which were formerly filled by them, have very few. Why this change? It seems to me that as we have a better understanding of arthritis deformans of the infectious type, by the removal of foci of infection and treatment by autogenous vaccine we have cut short the disease so that the atrophic type has no longer a chance to develop.

Treatment.—In the treatment of this type of arthritis little is to be done. If infection still persists it is wise to treat with vaccines.

Rehabilitation.—Rehabilitation offers a very serious problem. Almost all of the joints have been destroyed so far as their cartilages are concerned. If possible, the subluxations which have occurred should be straightened. An occasional arthroplasty, or arthrodesis, at an acute angle may be done on the elbow, but as a rule the de-

struction has been so great that there is no longer hope of restoration. The hope lies in the prevention of the atrophic type by proper surgical and medical treatment of the infectious type.

ARTHRITIS DEFORMANS OF THE HYPERTROPHIC TYPE

Arthritis deformans of the hypertrophic type, so-called osteo-arthritis or proliferating arthritis, to my mind should not be included under the term "arthritis deformans." It is a disease which has its own clear-cut signs and symptoms. Its etiology is entirely different from that of arthritis deformans of the infectious type, and there is no reason for confusing the two diseases. So many authors who write about arthritis deformans include osteo-arthritis. It is hard, therefore, when one is studying the problem, to gather the facts which are based on such premises. When writing, let us recognize that we are dealing with two different diseases.

Arthritis deformans of the hypertrophic type should have a different name. I would suggest that we call it rheumatic gout. It is not to any extent a deforming process. It is the most amenable of all diseases to proper treatment.

Pathology.—There is a deposition of bone around the edge of the synovial membrane; an osteosclerosis of bone and never an atrophy, except from slight disuse. The synovial membrane at times may be thickened but not to the extent that one finds in arthritis deformans of the infectious type. As a rule, there is no destruction of cartilage except by pressure; no neurological involvement which leads to atrophy. Perhaps, at times there is a slight increase of fluid within a joint like the knee, but never any increase in fluid of the joints of the hand. The osteosclerosis of bone is so great that there is no difficulty in distinguishing between the carpus and the soft parts, as in atrophic arthritis. It is a disease of new bone formation. The clinical picture is very distinct. In the first place it never occurs in young people. It is rarely seen before the age of forty-five years. It is associated on the part of the patient with a feeling of stiffness. He feels his symptoms more in the early morning when he attempts to get out of bed than he does after he has been up for some time. After sitting for a while, playing bridge or in the movies, it may be difficult for the patient to arise, but the more he walks the more limber he becomes. The joints themselves are characteristic. There is a swelling, but that swelling is generally bone. It is hard on palpation and asymmetrical, unlike arthritis deformans of the infectious type which is symmetrical and soft. There is no local heat, nor is there any general heat. The deformities, when they exist, deviate the joint slightly to one side owing to the new bone formation within the joint. In the hands it always attacks the distal phalangeal joints, so-called Heberden's nodes. It rarely ever attacks, as does the infectious type, the middle phalangeal joints, and when it does it is always secondary to the distal joint. There is no beginning atrophy of the muscles. Indeed, the muscles look perfectly normal. The general health is usually good, although in many cases there are symptoms of constipation. The patient, as a rule, looks well. There is rarely ever any change in the normal differential count, no leucocytosis, and seldom any secondary anemia. The polymorphonuclear leucocytes are never increased proportionately. The blood examination shows no bacteria. The uric acid content of the blood may be, but is not always, increased. The lymph nodes show no bacteria, and the various strains of streptococci used in sensitization give no reaction. Indeed, the patient always feels extremely well but walking is sometimes painful and stiffness is generally present owing to the new bone formation within the joint. The spine may be involved, and when it is, large, isolated masses of bone are thrown down, not like a growing spike but with the character of a large deposition, which may press upon the nerve roots and cause pain. It is an old person's disease.

Etiology.—The causes of hypertrophic arthritis are, first, heredity; second, food; third, traumatism; four, exposure. This is primarily a hereditary disease, not that we inherit rheumatic gout as such, but we inherit a soil which under proper conditions assumes a gouty tendency. All inherited soil is not alike, so as we inherit our faces we inherit our soil. If to this soil certain food products are brought after the glands of Lieberkuehn have disappeared, then osteo-arthritis, so-called rheumatic gout, will grow. Foods which generally produce the conditions are sugars and acids. Sugars themselves, or those things which break down into sugars in the body, namely starches, bring it on. Therefore, one should cut off sugars, pies, pastries, cakes, candies, ice cream, white bread, starches, corn-bread, hominy and such things. Now, if to this class of food is added certain acids, such as tomatoes, vinegar, oranges, alcohol, preserves,

then and then only will the rheumatic gout begin to appear. Exposure to wet and draught greatly expedite the process. Traumatism aids materially, in the places where these depositions are to occur. This disease, therefore, is a dietary problem and not a bacteriological one. Here elimination should be forced and plenty of water should be taken. This is the type which improves greatly at the springs, whereas the cases of arthritis of the infectious type are markedly injured by the debilitating process of the springs themselves. Protection is the keynote in mechanical treatment: supporting braces, adhesive strap bandages, rest rather than activity, massage when the process is not active. In cases where the process is severe it is necessary at times to do an arthrotomy and remove the localized new bone formation within the knees, about the hips, to relieve pain from the pressure of the body on these new deposits. The results of treatment of rheumatic gout by means of a dietary regime and proper temporary support are more gratifying than results from treatment of any other disease. Occasionally, the process may be so bad, as in the hip joints, on account of the new bone formation, that an arthrotomy has to be done. This would consist in removal of the excess of bone, leaving the entire neck as well as the cartilage on the head, which will permit the hip joint normal motion without pain.

In conclusion, let me say that I believe that if we recognize that we are dealing with at least two different diseases, absolutely opposite one from the other in all their characteristics, that we shall have made a great step forward. Also, when we recognize that what is food for one disease is poison for the other, that one is bacterial and the other is metabolic, then we shall be on the right path to solve the entire problem.

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THE THERAPY OF SUPERFICIAL MALIGNANCIES*

By J. M. MARTIN, M.D.,
Dallas, Texas

In talking with roentgenologists in my section of the Country, I get the impression that a majority of them are neglecting this particular class of work, giving as an excuse that they are busy with other things or that they are devoting the greater part of their time to deep therapy. I cannot understand why the radiologist should refer this class of case to dermatologists who are not using radiotherapy. I know no method of treatment in medicine or surgery where the results are better and more lasting, or where the cosmetic effects are so good, as they are following x-ray treatment of skin malignancies.

Why are we neglecting this particular part of our work? Is it because our technic has not been worked out in detail, so that we are afraid if we give enough treatment we shall produce burns? Is it because we are afraid that during

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Fig. 1

the period of reaction our patients will drift into the hands of dermatologists, who will frighten them by talking of x-ray burns? Is it because we are afraid that when the patient returns home, with a rather severe x-ray reaction, the family physician will prescribe an ointment containing chrysarobin, salicylic acid, or some other strong irritant, the escharotic effect of which will greatly exaggerate the effect of the x-ray dermatitis, for which the radiologist will naturally be blamed?

A radiologist not long ago admitted to me that he did not get good results in skin therapy, and did not know why. During our discussion I learned that he does not take the time thoroughly to explain the work to his prospective patient; neither does he keep a written history of his cases, nor a record of the examination and diagnosis. Photographs are never made of the lesions before and after treatment. He has not worked out a dependable technic, in which he has complete confidence. He does not follow up these cases by the year for a period of five years or more, in order to check the results. It is on account of these facts that he is not more generally successful in the administration of x-ray for the cure of cancer of the skin.

If we expect to be successful in the x-ray treatment of skin malignancies we must bring about a very active degree of reaction in the tissue, which will often frighten the patient, unless he is made to understand beforehand just exactly what is going to happen. When the family physician is not familiar with this reaction to x-ray therapy and he is consulted during the active stage, he is apt to alarm the patient by telling him that he has been burned. After an experience of this kind the patient is not likely to return to the radiologist for further observation and treatment, and the final results are far from satisfactory.

For more than twenty-five years I have been treating superficial malignancies very much in the same way that I am treating them today. In 1902 I visited Dr. Pusey, of Chicago, who at that time was probably doing more of this class of work than any other man in the middle West. My early technic was very similar to his, and I am using a similar technic today, except that the measurement of voltage and amperage is more accurate than it was at that time.

I have been able to follow many of the cases treated for a period of ten and fifteen years. While a few cases have died from cancer and many from other and natural causes, a large number of them are well today. I have photographs of all of these cases before and many after the treatment, and written reports at intervals varying from six months to one year since the treatments were concluded. The standard technic employed is a five-inch spark gap (about 84 kilovolt peak), 5 milliamperes, from 5 to 10 minutes, 10-inch target skin distance with a filter of 0.5 mm. of aluminum.

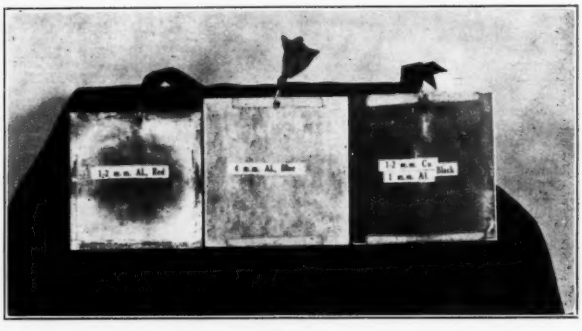

Fig. 2

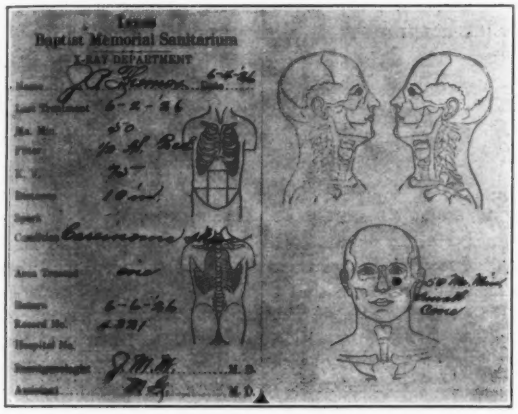

Fig. 3

A number of radiologists over the Country are not using filters in superficial skin therapy. Filtration is important and the use of 0.5 mm. of aluminum will prevent telangiectasis. In the early period of my work I did not use filtration. Many cases treated responded favorably, but the areas exposed in some cases showed a pink discoloration that was very undesirable. Since I began using 0.5 mm. aluminum as a filter in the treatment of superficial malignancies, there has seldom been the slightest evidence of this unfortunate after-effect.

Whether epithelioma is on the increase I do not know, but we are treating an ever-increasing number of cases each year. In the rural districts where there is exposure to various types of irritation, the most important of which are sunburn, wind, and dust during winter and summer, many people are found to develop cancer of the face and hand. This condition is also found among sailors and fishermen. Age, plus irritation, are apparently the most important factors in the development of cancer of the skin. Few lesions appear before the age of forty; after this age cancer of the skin is frequent among people who are subject to the kinds of exposure already mentioned. Senile and seborrheic keratosis are frequent conditions of the skin after middle life. When irritation of any kind is applied to tissues thus affected, malignancy not infrequently follows. X-ray treatment properly applied to such lesions not only is painless, but is followed by complete removal of the condition without any undesirable after effects. In many cases there is absolutely no evidence that the lesion ever existed.

Fig. 1.—This slide illustrates a booth in which the instruments of control are located, with the technician seated where the patient is clearly visible through a leaded glass window. All instruments of control are in easy reach of the technician in case the patient moves or attempts to get up from the table. This is a precaution that has saved us no end of trouble. It makes no difference how carefully you explain the dangers of touching the high tension wires or the terminals of the tube, patients often fail to appreciate the warnings, and should they have an accident, we are always accused of being careless in the administration of our treatments. Two milliammeters are connected in series. In case they do not check each other both of them are returned to the makers or are checked up by a standard meter in our office. The current is stabilized in order to keep our voltage constant.

Fig. 2.—The subject of filters is important and many mistakes have been made by using the wrong filter. Several years ago Dr. Pfahler gave us a very good method of identifying the filter. The picture on the screen represents three types of filters. A piece of red ribbon is attached to the 0.5 mm. aluminum, blue ribbon to the 4 mm. aluminum, and a black ribbon to the filter having 0.5 mm. copper and 1 mm. aluminum. When these filters are in place beneath the tube about four inches of ribbon hangs down in plain view of the technician in the booth. As a double check on this, I write a prescription, which is shown in *Fig. 3.*

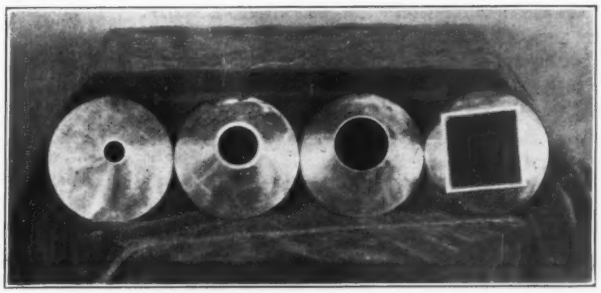

Fig. 4

Fig. 3.—You will note that all of the factors concerned in the treatment appear in this prescription. When the technician reads the prescription, and notes the filter being employed, she immediately looks through the window to see the color of the ribbon hanging beneath the tube. If the color of the ribbon corresponds with the filter indicated on the prescription, she writes red, blue or black in the prescription. If I write 0.5 mm. aluminum, the color of the ribbon should be red, and so forth.

Fig. 4.—This slide illustrates four cones used in the treatment of practically all types of skin cancer. In the early days I used various methods of covering the unexposed parts. To put a mask over the face or to cover the head completely is always uncomfortable. The cones here illustrated are made of heavy brass and are of four sizes. Three of them are round. The first has an outlet at the lower extremity of ¾ of an inch; the second 1½ inches, and the third 2 inches. The fourth, being square, is about 2½ inches. These cones are placed beneath the tube completely to protect all the surrounding parts. They are brought directly down on the tissues and are made to rest firmly around the lesion being treated. They have two distinct advantages: one in helping to keep the patient still during the time of exposure, and second, the direct rays are allowed to act exactly over the lesion.

Fig. 5.—This illustrates a patient lying on the table with the tube and cone in position. No unpleasant sensation is experienced by the patient, and if he is assured beforehand that a shock or burn will not result because of the cone's being in contact with the skin, he will have no objection to its use, and when it is once used, he will find it more comfortable than having the face covered up with lead, foil, or leaded rubber.

Cases showing senile and seborrheic keratosis are generally cured with three or four x-ray exposures using the factors mentioned.

When these factors are used for a period of five minutes, the effect on the average skin is about that of one erythema dose, and when the exposure is prolonged to ten minutes the effect will be double that of the first. In all cases, whether pre-cancerous or cancerous, the treatments are given every other day until the desired effects are produced. When an area over 1½ inches in diameter is exposed the dose represented above should be lessened because the larger the area exposed the greater will be the destructive effect of the x-rays on the skin.

The object of treating these lesions is to destroy them. In order to do this it is necessary to produce a certain amount of reaction in the tissues, depending, of course, upon the nature and size of the lesion. When the lesion is actually cancerous from four to six double erythema doses are usually necessary to accomplish the desired result. The reaction thus produced will appear in from six to ten days, and reach its height in about two weeks. The area exposed passes through the various stages of an x-ray dermatitis and begins to heal from the outer edge to the center. The recovery is usually complete in from two to six weeks, depending upon the amount of treatment given.

In conclusion I feel that we have in this method a means of curing a very large per cent of skin cancers with very little suffering to the patient, or loss of time, and with the least possible amount of disfiguration. It is a method

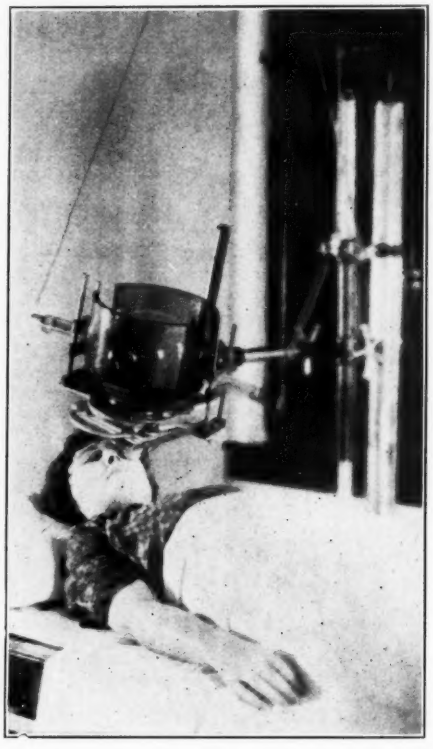

Fig. 5

that will compare very favorably with any other method under its most favorable conditions.

721 Medical Arts Building

DISCUSSION (*Abstract*)

Dr. D. Y. Keith, Louisville, Ky.—Dr. Martin is correct in his remarks about overdosage. In treating these wide areas of keratosis, you must not give the same doses that you give for a small lesion. If you do you will regret it.

We feel where the tumors are massive that radium probably gives a more flexible scar than x-ray. At the present time we are using radium for a greater portion of our epitheliomata than x-ray, simply because treatment can be concluded with one dose. As many patients are from out of town, it is probably a little more economical for them.

I know that Dr. Martin obtains good results in most of his cases with one dose of x-ray, but it is a massive dose of x-ray and if you are using the massive dose of x-ray be sure not to give that over as large a skin area as you would a single dose.

Dr. C. H. Heacock, Memphis, Tenn.—Frequently we see recurrences surrounded by skin that shows all the atrophic changes of over-radiation. I should like to ask Dr. Martin how he varies his technic in the radiation of such recurrences.

Dr. S. S. Marchbanks, Chattanooga, Tenn.—Dr. Martin mentioned that he gave treatments every other day until he got a reaction. We do not expect a reaction for five or six days.

I particularly wish to agree with Dr. Martin that in epithelioma of the lower lip x-ray is better than surgery. In an epithelioma the operator will usually make a v-shaped incision down, considerably beyond the growth. The x-ray treatment we know will come well beyond the area of extension. But if this is operated upon and the whole area removed, often not enough lip tissue will be left to close.

Dr. D. B. Harding, Lexington, Ky.—Several patients have come to me because of recurrences of this type of lesion, following treatment three to five years previously. They had been given large doses of unfiltered radiation by the use of radium plaques. The extensive scarring suggested to me that the severe radium reaction might have been responsible for the recurrence of the malignancy. The treatment of this type of lesion has been very unsatisfactory in my experience.

Dr. Howard E. Ashbury, Baltimore, Md.—I should like to ask Dr. Martin how frequently he meets with epitheliomas on the upper lip and if they respond to treatment by x-ray as readily as the lesions on the lower lip. Until five years ago I treated all epitheliomas with x-ray, then for a period of five years all of them were treated with radium, with results quite as satisfactory as with x-ray. At the present time I use x-ray, unless there is some definite indication for another treatment.

Dr. Vincent W. Archer, University, Va.—How much normal tissue do you take into the field in addition to the lesion? I believe Dr. Murphy, of the Rockefeller Institute, did some work four or five years ago in which he transplanted spontaneous cancer and radiated both the excised tissue and as controls the place into which it was to be transplanted and the area from which it was taken originally. He found that the excised tissue would stand six times the lethal dose without destruction of the cancer cells, 85 per cent of the transplants taking. I believe the amount of normal tissue that is taken in, in addition to the malignant field, is quite important.

Dr. Martin (closing).—The time is too short to answer these questions fully. The question of whether I vary the technic in cases that in which other men have failed is hard to answer. I would much rather a case had never been treated. After a case has been treated and there is a good deal of atrophy, further treatment is of doubtful effect. I promise nothing, but do the best I can. Sometimes I do vary the treatment, but I cannot tell you how to do that in any particular case. Sometimes my final results are not good with cases that were formerly treated, and some cases can be cured, provided they have not had previously too much x-ray.

Epithelioma of the upper lip is rare in my experience. I have had but three cases, two in men and one in a woman. They have all been treated with x-ray and have responded very well. They had had no previous treatment. One was a man forty-four years old, who told me that from the time he was twelve years old he had carried a pipe in the affected corner of his mouth.

I like to expose all of the abnormal tissue and a sufficient amount of the normal tissue. The amount of normal tissue exposed, or what appears to be normal tissue, always depends upon the size of the lesion and the length of time it has been in progress.

The normal tissues will stand a reasonable degree of over-exposure, but we should be careful not to overtreat the cases because of what may develop in years to come in the areas exposed. If roentgen carcinoma has followed my treatment of a single case of cancer of the skin I do not know it. I am constantly seeing cases that have been treated five and ten years ago, and if such a result was in the least common I would meet one occasionally.

ENDOCRIN ASPECTS OF SCLERODERMA: REPORT OF A CASE WITH GLANDULAR DYSFUNCTION*

By EVERETT R. SEALE, M.D.,
Houston, Texas

Scleroderma is a condition varied in its morphologic characteristics and in its association with internal disorders. Consequently, the literature is liberal in etiologic suggestions. Endocrin disorders, both individually and collectively, have been most frequently cited, and of late, studies from a neuro-vegetative viewpoint have appeared promising. My case was studied from both of these aspects.

CASE REPORT

The patient, J. P., a female, first presented herself for treatment in December, 1925. At this time she was fifteen years and three months of age. The skin

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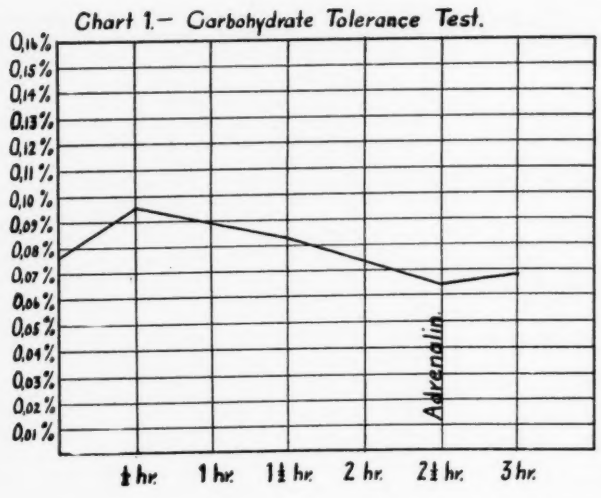

condition had first made its appearance two years previously as a dime size, white and scaly lesion, on the left side of the neck. One year later similar lesions appeared on the flexor surfaces of the wrists and dorsum of the feet. Unlike the condition on the neck, the process progressed rapidly and soon the skin became hard, thickened and hide-bound at these sites, as did the greater portion of the skin of all four extremities. Lastly, the trunk became involved, but here in a different manner, to be described presently.

The family history revealed nothing of importance. She had had measles at the age of three, and pertussis at eleven. She had not menstruated.

Physical examination revealed an intelligent young white girl of fifteen years and three months of age having the body conformity of a 10-year-old child. No hair was present on the pubic or axillary regions. The breasts were markedly undeveloped. The patient's weight was 74 pounds, height 60½ inches. A scoliosis, its convexity to the left of the upper thoracic vertebrae, was noted, with a resulting raising of the left shoulder.

The blood pressure was 94 systolic and 54 diastolic; the pulse rate was 90. The patellar reflexes were sluggish but equal. The elbow joints were partially flexed and complete extension was impossible because of the hide-bound condition. Otherwise examination revealed nothing abnormal.

The peculiar skin condition began about the level of the thyroid cartilage. From here to the level of the second rib and over the shoulders the process was well developed. It consisted of small, ivory-colored, numerous 2 to 3 mm. square or diamond-shaped, fleck-like lesions embedded in the skin. Others were linear. In addition, apparently by confluence, white, slightly scaly, crinkly areas had developed. In both infraclavicular regions several well defined linear striations about 2 mm. wide, paralleling each other and of length varying from a few mm. to 1.5 cm., were present. The intervening skin was normally tinted. It appeared depressed, but actually was not; palpation nowhere revealed infiltration or unevenness of the surface. Beyond these striations, extending over the deltoids symmetrically (the whole process was remarkably symmetrical) were numerous white flecks and larger scaly areas. These ended at the middle third of the arms in two circumferential sclerodermatous bands about 6 cm. in width, which caused marked constrictions. The tissue over the elbow joints and to the middle third of the forearms was normal. Here other sclerodermatous bands were present, extending down the forearms nearly to the wrists. These were only on the flexor surfaces. The palms and soles were normal.

From the level of the second rib to the level of the umbilicus was fairly normal skin, a few white flecks being present laterally. About 5 cm. below the navel there was a horizontal band of thickened, firm skin. On the flanks at the umbilical level, but most marked over the buttocks and iliac regions, the white flecks were present abundantly but without the linear arrangement. Here some of the lesions were fairly large. Likewise, in these regions the superficial venous network was pronounced. This network was also apparent on the neck and deltoid region. The white flecks extended to the junctions of the upper and middle thirds of the thighs, where a sclerodermatous plaque on the anterior thighs occupied the middle third. The skin was then fairly normal until a few inches above each ankle, where a firm sclerodermatous thickening embraced each ankle with a resulting ulcer on each.

The posterior surface of the neck was free from the disease. The rest of the surface was involved, except for a hand-sized area between the scapulae. This region was normal except for one area of crinkled depigmented skin in it.

Over the scapulae and the rest of the back the skin was dry, crinkled, finely scaling, white, and the follicular openings which still retained some pigment gave a stippled appearance to the surface. There was a bridge of affected skin extending across the upper back at the level of the second dorsal and below at the level of the ninth dorsal spine, where the affected areas joined. This left the triangular interscapular free area mentioned above. At the level of the waist the white fleckling became better defined. This zone extended on to the buttocks, but the skin over them was normal for the most part. The posterior thighs showed a few white flecks; in the middle third, moderate deep sclerodematous infiltration. The posterior legs showed no skin disease, although both legs were thinner than normal because of defective muscular development.

The scalp hair was normal except very dry. The eyelashes showed only thinning of the outer quarter. The face was puffy, the skin being smooth, shiny and without wrinkles, all of which gave it a myxedematous appearance.

Histology.—A section of skin was removed from the center of one of the linear striations in the right infraclavicular region. Hematoxylin-eosin and Weigert's elastic tissue stains were made.

Examination revealed the epidermis to be little altered. The stratum corneum was normal; the stratum

Fig. 1.

The patient at fifteen and one-half years of age, showing lack of development of secondary sexual characteristics, sclerodermatous bands around each arm, and hidebound condition of forearms.

lucidum was not observed; the stratum granulosum consisted of a single layer of cells; the stratum mucosa was slightly thicker than normal and the prickles were indistinct. The basal layer showed no abnormality. The interpapillary pegs were partially flattened out.

Examination of the corium revealed an increase of the collagenous bundles with flattening out especially in the subepidermic region. The bundles had become horizontal at this site and were parallel to each other instead of showing the usual interlacing. Areas of hyaline degeneration were observed throughout the corium. Edema was a prominent feature with dilatation of the lymph spaces and blood vessels; this, too, being more pronounced in the upper portion. There was a moderate perivascular infiltration of connective tissue cells and small lymphocytes. In the upper portion of the mid-cutis a compressed remnant of hair follicle was observed.

The elastic tissue was not decreased. In the upper corium, especially in the subepidermic region, the fibers were fragmented and clumped. In the deep cutis the fibers were essentially normal.

Laboratory Findings.—The basal metabolic rate was below normal, minus seven and minus twelve on two occasions.

Blood count revealed an anemia; red blood cells 3,360,000, the hemoglobin 66 per cent, white blood cells 8000; the differential count was normal. Several urinalyses were negative. Several blood Wassermann reactions were negative.

Course.—For the following sixteen months the patient was given thyroid and ovarian extract with no change in the skin condition, although she gained ten pounds in weight. At sixteen years of age, scant hair first appeared on the mons pubis. At sixteen years and seven months she first menstruated. She returned three months later and for the first time definite improvement was noted. The sclerodermatous bands on the extremities showed marked regression, although the white spot condition revealed little change. Following this visit, the patient discontinued all medication and practically passed from under observation until the present time.

At present the true sclerodermatous process is markedly improved, the only remaining activity being a partially unresolved band around each arm, and of the skin of, and immediately above and below the ankles. At the latter site, as shown by photographs, activity is still noticeable, although regression is marked. Other areas that were affected have cleared up completely and only atrophy remains.

The white spot process has likewise improved, many of the areas having disappeared without apparent trace, while others have left small atrophic areas corresponding to macular atrophy. On the arm in the right deltoid region a depigmented patch with a central brownish maculo-papule has developed ("Leucoderma aquisatum centrifugum" of Sutton).

Routine physical examination at present reveals a well nourished girl of eighteen years of age with a body conformity fitting to her age. Her face appears practically normal, although there is still a semblance of the former myxedematous appearance. Menstruation occurs every forty days and is scant in amount. The blood pressure is 92 systolic and 54 diastolic; the pulse rate is 90. Otherwise, the physical examination is that of 1925.

Laboratory Examination.—The blood count, aside from showing a slight anemia, 4,200,000 red cells, is normal. Routine urinalysis and examination for arsenic are negative.

The basal metabolic rate is minus 19.

BLOOD CHEMISTRY

Non-protein nitrogen	31.5	mgs. per 100 c. c. of blood
Urea nitrogen	14.2	mgs. per 100 c. c. of blood
Uric acid	2.9	mgs. per 100 c. c. of blood
Creatinin	1.57	mgs. per 100 c. c. of blood
Calcium	11.7	mgs. per 100 c. c. of blood serum

The sugar tolerance estimated before and after administration of 1.75 grams of glucose per kilogram body weight was estimated.

Fasting stomach	77	mgs. per 100 c. c. of blood
63 gm. of glucose administered per os.		
After ½ hour	95	mgs. per 100 c. c. of blood
After 1½ hours	83	mgs. per 100 c. c. of blood
After 2½ hours	64	mgs. per 100 c. c. of blood
Adrenalin 10 minims subcutaneously.		
After 3 hours	68	mgs. per 100 c. c. of blood

Dr. R. K. McHenry was kind enough to examine

the head, thoracic spine and chest roentgenoscopically. His report follows:

Head.—Skull vault is well within normal limits and there is no evidence of pathologic bone or suture changes. The sella turcica is well within normal limits in size and shape, is wide open and shows no evidence of erosion of the floor or of the clinoidal processes. The pineal body shows a calcification of both lobes.

Thoracic Spine.—There is an acute left sided scoliosis of the upper thoracic vertebrae with the greatest convexity at the third and fourth vertebrae, but this is apparently functional, for there are no pathological bone changes within the involved vertebrae.

Chest.—Supra cardiac area is well within normal limits and shows no evidence of an enlarged thymus.

Tests of the Function of the Vegetative Nervous System.—Adrenalin chlorid, 10 mms. of 1/1000 solution was given subcutaneously without any change in pulse rate, blood pressure, or temperature, nor were any subjective symptoms complained of.

Atropin.—1/60 grain of atropin sulphate was administered subcutaneously, with an increase in pulse rate of 21 beats per minute and marked dryness of skin and mouth (*Table 1*).

TABLE 1

Effect of 1/60 Gr. Atropin Sulphate Subcutaneously

	Before Injection	After 5 min.	After 10 min.	After 20 min.	After 30 min.	After 45 min.	After 60 min.
Pulse rate....	90	82	92	105	104	111	107
Temperature	98.2	98.2	98.3	98.3	98.4	98.4	98.3
Bl. pressure.. (Systolic)	90	90	90	94	94	98	94
Dryness (x)	—	1	1	1	2	2	1

(x)Intensity designated on basis of 1, 2, 3.

Pilocarpin.—1/8 grain of pilocarpin hydrochlorid was administered subcutaneously with pronounced sweating and salivation (*Table 2*).

TABLE 2

Effect of 1/8 Gr. Pilocarpin Hydrochlorid Subcutaneously

	Before Injection	After 5 min.	After 10 min.	After 20 min.	After 30 min.	After 45 min.	After 60 min.
Pulse rate....	88	105	103	100	94	92	92
Temperature	98.2	98.3	98.4	98.3	98.3	98.2	98.2
Bl. pressure.. (Systolic)	90	98	96	94	94	92	92
Sweating (x)	—	1	2	2	1	1	—
Salivation(x)	—	1	2	2	1	1	—

(x)Intensity designated on basis of 1, 2, 3.

DISCUSSION

Morphologically to recapitulate, two types of lesions were observed: first, the true hidebound and band-like scleroderma of the extremities, and second, the small multiple lesions found on the torso and upper portion of the extremities. The second type of lesion was a lentil size, white, shiny, sometimes scaly lesion, embedded in the skin; it was not raised or depressed. The surrounding skin was of normal hue. There was a tendency for the lesions to become confluent and form white, slightly scaly, crinkled areas and linear striations. Some of the lesions disappeared without macroscopic trace, while others left small atrophic areas which regained normal pigmentation.

The noteworthy microscopic findings were: a little altered epidermis, flattening of the rete pegs, increase and swelling of the collagenous bundles with a tendency to become horizontal with the surface, edema and dilatation of the lymph spaces and blood vessels. There was no decrease in the elastic tissue, although clumping and fragmentation was noted, especially in the subepidermic region.

Upon attempting to place this case in its proper nosologic posi-

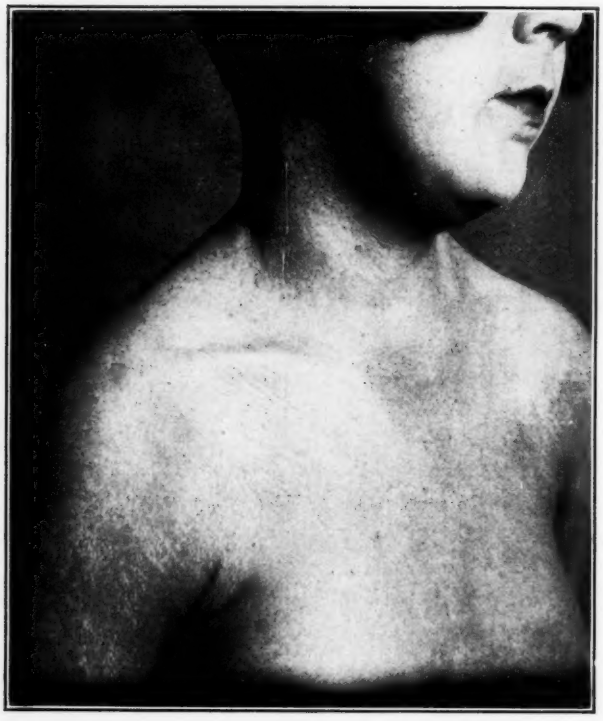

Fig. 2.
The white spot condition in 1925, showing discrete and confluent lesions and linear striations.

tion by considering the white spot condition, we have a difficult problem. It will be treated only superficially. In 1914, MacKee and Wise, after a review of the literature and a study of their cases, came to the conclusion that there were two distinct groups of diseases giving rise to white spots, the scleroderma and lichen planus groups. They were of the opinion that the "transitional" cases would after further study "be relegated to one or the other of the two groups mentioned above." Since then, Wise and Shelmire,[2] after further study, consider the cases described by Csillag[2] as "Chronic Atrophic Lichenoid Dermatitis," and Von Zumbusch[2] as "Lichen Albus," together with two of their cases, to constitute an entity designated by Csillag, chronic atrophic lichenoid dermatitis. After a review of the works of American writers on this subject, I am of the opinion that my case more nearly conforms morphologically to the scleroderma group; that is, "white spot disease," as described by MacKee and Wise in 1914. My case differs from their description only in that linear striations were noted. Ormsby,[3] however, states that the lesions usually remain discrete, showing little tendency to coalesce, although occasionally he admits "irregular patches are formed by incomplete coalescence of individual lesions." At any rate, the "comedo-like plugs or minute pit-like depressions" of lichen planus sclerosis, as stressed by Ormsby,[4] or the "indurated, round and oval well defined papules appearing in closely agminated groups of individual lesions" of chronic atrophic lichenoid dermatitis as stressed by Wise and Shelmire[2] were not present in this case. The lichen planus-like papules seen in lichenoid scleroderma guttata[5] were never observed.

Histologic differentiation will not be attempted, as it appears futile after a perusal of the literature. All of the above mentioned processes have many features in comman in their different stages of evolution.

Endocrin Glands.—As previously stated, practically every gland of internal secretion, singly or grouped, has been found to be functioning abnormally in cases of scleroderma. The close interrelation of the various endocrin glands is well known and dysfunction of one is associated with compensatory changes in the others. Both structural and functional changes being the most easily detected in the thyroid, it appears quite reasonable that it should bear the brunt of the attack. This case presents evidence of deranged function of several glands of internal secretion, and other deviations from normal.

Thyroid.—That there is a functional disorder of the thyroid gland in this case, whether primary or secondary, there can be no doubt when we consider the basal metabolic readings of minus 7, 12 and 19, on three separate occasions. The facies, dryness of the skin and hair and delayed sexual development conform to the clinical findings in hypothyroidism. It is not necessary to dwell at length on the thyroid relationship to scleroderma, as this has been done

Fig. 3.
The hidebound condition of the ankles with resulting ulcerations (1925).

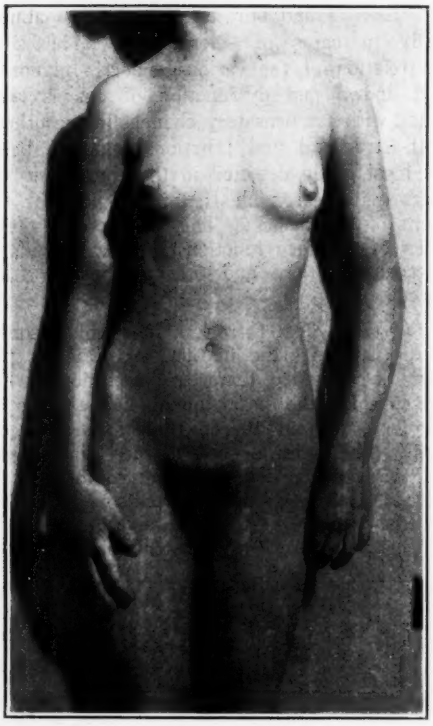

Fig. 4.
The patient at the present time, normally developed with regression of sclerodermatous process.

by many authors. Dittisheim[6] reports eight cases of scleroderma out of seventeen cases of Graves' disease. On the contrary, many cases have been reported in patients with myxedema or with no demonstrable evidence of disease of the thyroid. Castle[7] appropriately states "The very fact that scleroderma has been known to occur in both thyroid hypertrophy and in thyroid atrophy makes one cautious." If the sole cause be in this gland, should we not expect to see more frequent improvement after treatment directed at this site? At any rate, good results are obtainable after appropriate measures in Graves' and Gull's diseases in which the pathological condition is known.

Gonads.—Dysfunction of those glands governing sexual development is evident. The ovaries alone cannot be blamed as the pituitary, thyroid, suprarends, and possibly the thymus and pineal all play an important role in normal growth. If it were possible to connect only the ovaries and the retarded development, we could hardly attach to this fact any concise etiological significance in the skin condition. Although scleroderma occasionally appears at the menopause and associated amenorrhea (Luithlen[8]) has been reported, still ovarian disease (dysfunction) and extirpation of the ovaries is very common and scleroderma is rare. It is interesting, however, to note in this patient the rapid regression of the process after menstruation was established.

Suprarenals.—Hyperpigmentation was not noted, although the blood pressure has been persistently low. Aside from the latter, and the lack of response to adrenalin, no suggestion of suprarenal hypofunction was noted. The frequency of the increase in pigment (144 of Lewin and Heller's[9] 508 collected cases), is difficult to explain except by suprarenal involvement. Postmortem examinations, however, are our only sure tests for determination and they have been too infrequent for me to chance an opinion.

Pituitary.—Retarded development, the scanty growth of hair, low blood pressure and increased sugar tolerance are all indicative of hypopitui-

Fig. 5.
To illustrate improvement of the scleroderma of the ankles.

Fig. 6.
Increase in collagenous bundles with condensation, edema of the cutis, mild perivascular infiltration, dilatation of lymph spaces, and areas of hyaline degeneration (Hematoxylin-eosin stain).

tarism. X-ray shows no change in the sella turcica. The carbohydrate tolerance curve showed a definitely increased sugar tolerance. This finding is frequent in hypopituitarism. The importance of the pituitary gland in scleroderma has been stressed by many authors.

In discussing the importance of the carbohydrate tolerance test, the response after adrenalin or stimulation of the sympathetic, Ringer and Baumann[10] state:

"Just as the patellar reflex may be used clinically for roughly determining the state of nervous tension of an individual, so the carbohydrate tolerance test may be used clinically for determining roughly the state of an individual's tonus of the sympathetic system. But we cannot employ that at present to differentiate between affections of the thyroid, pituitary or adrenal."

Pineal.—The calcification of the pineal gland was interesting because of its bearing on sexual development. Recently, however, Murphy[11] in 100 consecutive roentgenograms of the skull found 40 calcifications of the pineal.

Thymus.—The thymus by roentgenographic examination showed no abnormality.

Arsenic and Syphilis.—Examination for arsenic was negative on two separate occasions, as were the several blood Wassermann tests, so these etiological suggestions will not be considered.

Chemical.—In 1924 Gitlow and Steiner[12] called attention to the study of scleroderma from a chemical standpoint. The blood chemistry in my case is wholly within the normal limits with the possible exception of the serum calcium, which was slightly above normal (11.7 mgs. per 100 c. c. of blood serum). Hawk and Bergium in their "Practical Physiological Chemistry," give 9-11 mgs. per 100 c. c. of blood serum as the normal limits. Gitlow and Steiner's patient's blood calcium content was low, 6.31 and 7.2, on two occasions, whereas Pulay's two patients showed an increase. The blood sugar content was low in my patient, as was one of Longcope's[13] eight patients who showed a distinct hypoglycemia in contrast to Knowles and Ludy's[14] patient, who had diabetes mellitus.

Autonomic Nervous System.—The tests of the function of the vegetative nervous system show a hyperirritability of the para-sympathetic or a state of vagotonia (Eppinger and Hess[15]). Injection of 10 mms. of adrenalin (sympathetic excitor) was followed by no response, while injection of 1/8 grain of pilocarpin (para-sympathetic excitor) was followed by profuse sweating and salivation, flushing of the cheeks, and

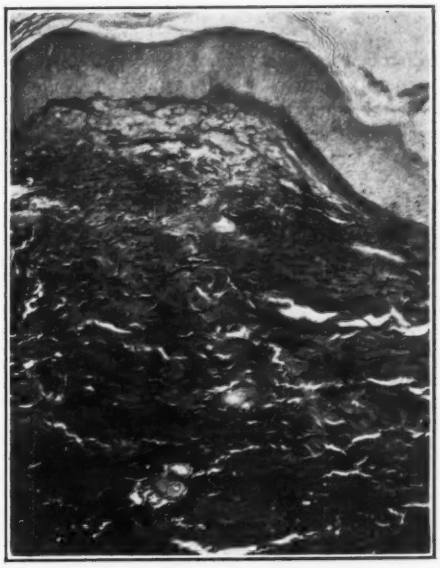

Fig. 7.
Fragmentation and clumping of the elastic tissue in the upper cutis.

precordial pain. Injection of 1/60 grain atropin sulphate, which paralyzes the para-sympathetic, was followed by an increase in the pulse rate to 21 beats per minute and a pronounced dryness of the skin and mouth.

The vegetative or autonomic nervous system consists of two divisions, as Reede[16] states:

"One arises from the midbrain, the bulb and the sacral portion of the cord, passes out through the oculomotor, the facial, glossopharyngeal, the vagus and the pelvic nerves, and is termed the craniosacral or extended vagus division or para-sympathetic. The office of this nervous system is to slow or depress function, and it becomes in this way a conservator of energy. The other division of the vegetative system arises from the cord from the first dorsal to the fourth lumbar segments, and is called the thoracico-lumbar division and corresponds to the former so-called sympathetic system. The effect of this nervous system is to accelerate or heighten function and it becomes thus an exploiter of energy."

Normally, these two systems are in a state of tonus (Eppinger and Hess[15]), while as in certain diseases, especially those of the endocrin system, an increased or diminished irritability is noted. As Reede[16] further states:

"The interrelation of the ductless glands and the vegetative nervous system is so intimate that a disturbance which is primary in one at once affects the other, and for physiologic purposes they may be considered as an entity, namely, neuro-endocrinological mechanism."

Hoffman,[17] employing the above tests in thirteen cases of diffuse scleroderma and seven cases of scleroderma *en plaques*, found a uniform lack of general reaction to adrenalin and a lack of rise of the sugar curve after adrenalin; a nearly always positive reaction to atropin; an always positive reaction to pilocarpin. Employing the same tests on apparently normal individuals, he found only an occasional reaction similar to those of his sclerodermatous patients.

Hoffman[17] does not agree with Eppinger and Hess[15] that there is a definite tonus between the two systems, but considers that the response to the pharmacodynamic tests is noted more quickly and more frequently in those abnormal individuals who have an increased irritability of the autonomic system, or, as he terms it, are afflicted with an unstable vegetative constitution. He further states that people under the influence of abnormal endocrin hormones tend to be excessively vegetative.

COMMENT

Approaching the causation of scleroderma from this light, we may connect the variously stressed causes more closely. As Hoffman brings out, those individuals who develop the disease are possessed of an inherent, unstable vegetative constitution, the result of an abnormal neuro-endocrinological mechanism often evidenced as dysfunction of one or more endocrin glands. Under the influence of shock, cold, trauma, nerve injury, syphilis, they develop scleroderma where normal persons do not.

I wish to thank Dr. J. C. Michael for the opportunity of studying this case and for his helpful suggestions.

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1017 Medical Arts Bldg.

DISCUSSION (*Abstract*)

Dr. D. C. Smith, University, Va.—Scleroderma is an example of the frequently used method of deriving a name for a condition from its outstanding symptom. It has been my habit to think of scleroderma as a term covering a group of diseases, rather than a disease. It is a symptom complex with various etiological bases and clinical manifestations. Careful and complete studies of these cases, and careful work-up are essential for the future scientific classification of this syndrome.

I have always thought of scleroderma as a scar of the corium, with minor changes in the epithelial layers

which frequently extend to the subcutaneous tissue and fascia. Undoubtedly, there are numerous types of injurious agents which result in this condition.

Dr. Seale suggests that all of these cases have an abnormal neuro-endocrinological mechanism, as the fundamental primary abnormality. The advocates of the infectious, toxic, chemical, and vascular theories might not admit that this is true. The question might be asked whether the neuro-endocrinological change is an effect rather than a cause.

The classification of scleroderma as given by Wise is about as good as I have seen. It is as follows:

Diffuse scleroderma, or hide-bound disease; sclerodactylia; circumscribed scleroderma, or morphea; and, scleroderma guttata, or white spot disease. These varieties, along with the marked variation in other factors, certainly suggest that there is not a single causative factor. It seems, however, to be proved beyond a doubt that endocrin and nervous disease is the basis for a certain proportion of cases. It is my opinion that as our knowledge increases this disease will be subdivided, as has happened in the case of eczema; that we will find out that a portion of it is due to one thing and another portion to another.

Dr. George M. MacKee, New York, N. Y.—As has been stated, the disease has a polymorphous etiology and symptomatology. In this case there is a very definite endocrin dysfunction. It is to be hoped that more cases of this disease will be investigated from an endocrin, chemical and other points of view. In this way, in the course of time, an accumulation of reliable data may shed light on the obscure etiology of scleroderma.

Dr. O. E. Denney, U.S.P.H.S., Carville, La.—I wish to call your attention to the fact that a sclerodermalike condition is extremely common in leprosy. The lesions usually extend from the knee to the ankle, and are sometimes seen on the back of the hands, extending up toward the elbows. I venture to say at the present time we have fifty cases in the Leprosarium.

The condition is rarely found in the pure nerve type or in the pure skin type, but it is commonly seen in the mixed type. The lesions are usually anesthetic.

We have done comparatively little histological work on these conditions, but the lesions suggest a neurotrophic source.

Dr. J. C. Michael, Houston, Texas.—Having observed the patient whom Dr. Seale has studied for several years, I should like to refer to certain features which have interested me. First, the clinical appearance of the condition was not unlike the case reported by Wise and Shelmire under the caption of dermatitis chronica lichenoides atrophicans (Csillag). I have seen both of these patients; so has the elder Dr. Shelmire, and we were both struck by certain resemblances, particularly the band-like striations and white macules. I think that Dr. Seale's patient presents a borderline case between lichenoid scleroderma and Csillag's disease. Next, the investigation of Dr. Seale, supplementing that of Hoffman in a series of scleroderma, has given us, I think, a better insight into the pathogenesis of scleroderma. When we speak of the toxic, infectious, leutic and other origins of scleroderma, we must recognize that there must be another factor (a predisposing one). Hoffman's work gives us something to lean on in this respect. He advanced or supports the conception of a state of instability of the vegetative nervous system (and the endocrinous which is interwoven with it) in patients with scleroderma. This unstable state can be determined by suitable tests. It is in those with an unstable vegetative nervous system that trauma and infections cause scleroderma. This, it seems to me, is the best hypothesis in the present state of our knowledge.

COMPOUND FRACTURES CONVERTED INTO SIMPLE FRACTURES*

By E. BENNETTE HENSON, M.D.,
Charleston, W. Va.

The management of compound fractures is not in the least standardized, which is to say that the ideal has not been reached. Surgeons throughout the Country are striving to achieve the same end, each using that method which he feels will restore the patient to his place in society in the best possible condition in the shortest space of time.

Realizing that the compound fracture cases were looked upon by hospital attaches as boarders, we started a few years ago a campaign to shorten the hospital stay of this class of patients by very rigid hospital care, particularly on admission. Dakin's tubes were soon discarded and a careful cleansing of the wound with fixation of the fractured bones where it could be done easily and debridement of the devitalized skin and muscle tissue with closure of the wound by interrupted sutures and skin clips was begun. The success attending these cases gave us more confidence until soon we were closing every compound fracture that permitted primary closure, if it was admitted within twenty-four hours after the injury. We were surprised to find that many of these healed without infection and were ready to leave the hospital in two to three weeks.

In those cases which became infected, immediate treatment by Dakin's solution was instituted. The hospital days were not prolonged by the attempt to obtain primary healing, but we are confident that much time was saved by an earnest effort on admission to prevent infection.

We attempt to close every compound fracture if it is admitted the day the accident occurs, whether the fracture be of the skull or a phalanx of toe, or any other bone between these two,

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*Read in Section on Bone and Joint Surgery, Southern Medical Association, Twenty-Second Annual Meeting, Asheville, North Carolina, November 12-15, 1928.

unless the condition of shock does not permit operative interference. Since the tibia and fibula are most often the bones involved in compound fractures, this type of fracture will be used to illustrate our method of treatment.

The violence producing a compound wound is usually sufficient to fracture the bone in such a way that fixation by mechanical means is simple. The fracture of the tibia is often comminuted in a spiral, oblique or crushing manner which allows easy fixation (*Figs. I* and *II*). Many times a sliver of bone can be used as a graft (*Fig. II-G*). If position cannot be maintained by the use of kangaroo tendon, either by passing it through drill holes (*Fig. II-F*), wrapping (*Fig. II-H*), by periosteal suturing end to end, or by modeling a cabinet maker's joint with the two ends of bone, using bone nippers or bone saw (*Fig. I-B*), we prefer to use skeletal traction by means of the Cannady-Beasley calipers (*Fig. I-A*), Steinmann pin, or Finneschieto stirrup, rather than to use Lane plates or a similar material. The object in view is to prevent infection, and in order to accomplish this one must avoid prolonged and difficult manipulation with its additional trauma. For the same reason we refrain from extensive debridement, but rather depend upon thorough cleansing and removing all dirt and foreign material with minimum manipulation. Shock is so often encountered in these cases that to prolong operative measures beyond the rapid cleaning up and suture of wound would be unwise. Traction can be depended upon to maintain position here as in any simple fracture. We find it necessary to use adhesive traction in a number of cases and have not had much difficulty in obtaining good position.

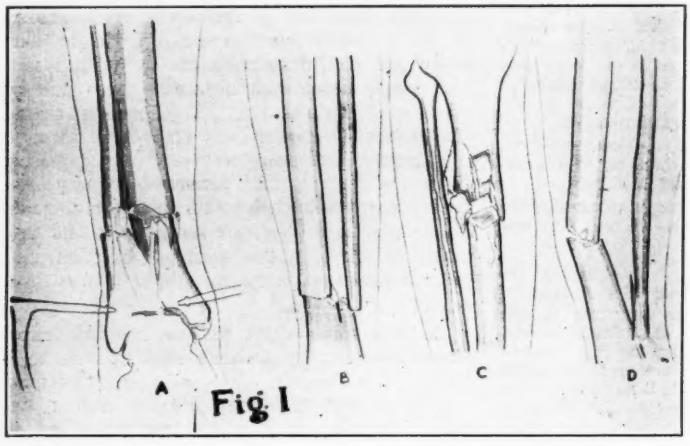

Fig. 1

Tracings of x-ray films of fractures (compound).

Type A.—Cannady-Beasley calipers in position in effort to force the fractured tibal fragments in position by continuous pressure.

Type B.—For cabinet maker's modeling to avoid over-riding.

Type C.—Sliding graft held fast by heavy kangaroo tendon.

Type D.—Slight alteration of fragments by bone nippers with periosteal sutures is all that is required.

TYPES OF WOUNDS

When a fracture of the tibia and fibula is produced by a fall with the feet extended, causing the ends of the bone to be jammed into the ground (*Fig. II-E*), the end thus jammed should be cut away at least 1 cm. before being returned to its position, to avoid absorption of devitalized bone end and delayed union.

One of the difficulties encountered in closing a compound fracture of the leg is the tension required. This can be overcome by making small incisions on either side of the wound to relieve pressure (*Fig. III-L*). In this way there is no danger of sloughing of the skin, provided the devitalized skin edges have been removed. Occasionally it will be necessary to do a sliding skin and fascia graft to cover exposed bone if the wound is over the anterior crest of the tibia, which unfortunately is common (*Fig. III-K*). We cover over the tibial crest at all costs, for if a gaping wound occurs here, a localized osteomyelitis and delayed healing of fracture usually follow. By the simple expedient of suturing healthy skin to healthy skin without tension over the tibial crest one can secure primary healing. This often requires one to leave a large gaping wound on either side of the leg, but this is not so bad as it sounds for the reason that the newly-made wounds have muscle and fascia beneath, and not bone (*Fig. III*). Primary healing is thus obtained where most desired and the secondary wounds can be closed in four or five days after the swelling has subsided, or a skin graft may be done.

In cases of severe shock the wound is cleansed, as well as surgical judgment dictates, packed with some antiseptic solution, and left alone until shock has been overcome. In one case thus treated at the Charleston General Hospital by one of my colleagues, a delay of five days was allowed before skin closure was attempted, with primary healing of the wound.

As was previously stated, we attempt to close every compound fracture seen within the first twenty-four hours, and it goes without saying that not all heal without infection. Many times the laceration of soft parts is so extensive that closure is impossible. In these cases we clean up as best we can and apply some antiseptic dressing. Iodoform gauze is often used. More recently we have used a heavy Unna paste dressing, and over this a light plaster cast, which is bivalved. The temperature chart is watched carefully. If the temperature remains normal the wound is not dressed until the patient strenuously objects to the odor. When the temperature begins to climb a careful inspection of the wound is made to determine the severity of infection, to institute treatment to combat infection, and if possible to protect the fracture.

The following case will illustrate fairly well the method used upon cases admitted with compound fracture:

Jeanette B., age 27, was admitted to the Charleston General Hospital November 14, 1927, at 5:00 p. m. with a history of jumping from a second-story window at 4:00 p. m., the left foot landing in a small hole in the ground. Upon admission, the proximal end of the tibia was protruding through the opening in the skin, with the foot lying inverted (*Fig. II-A*). The weight of the fall was on the left leg.

Operation two hours after accident was: the punctured wound of skin on the mesial surface of the left leg lower third was enlarged 1 cm. The proximal end of the tibia was nipped off with rongeur forceps, the wound was then cleansed with iodin, and the exposed bone was replaced. The fractured ends of the tibia were brought into alignment, and drill holes were made through the distal and proximal ends, through which heavy kangaroo tendon was passed and tied, holding the fracture firmly in position (*Fig. I-B*). The fibula was broken in two places, upper and lower third. The ragged skin margins were cut away and the wound closed with heavy silk. The leg was placed in a form-fitting wire splint for fixation. The wound was dressed on the fifth day and found to be healing nicely. On the fourteenth day a plaster cast was applied and then the patient was allowed to go home. Union of fracture was sufficient to allow weight bearing at the end of the tenth week.

In a review of one hundred cases we find that 90 per cent of the cases of compound fractures occurring in the coal mines heal by primary union. Those occurring on the streets do not heal by primary union as often as those occurring in coal mines. This is easily understood by physicians acquainted with coal mining. The mines are fairly free from contamination, whereas the streets are filled with contamination.

There has been no case of non-union and but one case of delayed union of the tibia in the past two years. This case required six months to unite, but was one in which there was a compound fracture of both tibia and fibula (*Fig. I B* and *C*), which probably had something to do with delayed union.

There have been no secondary wound com-

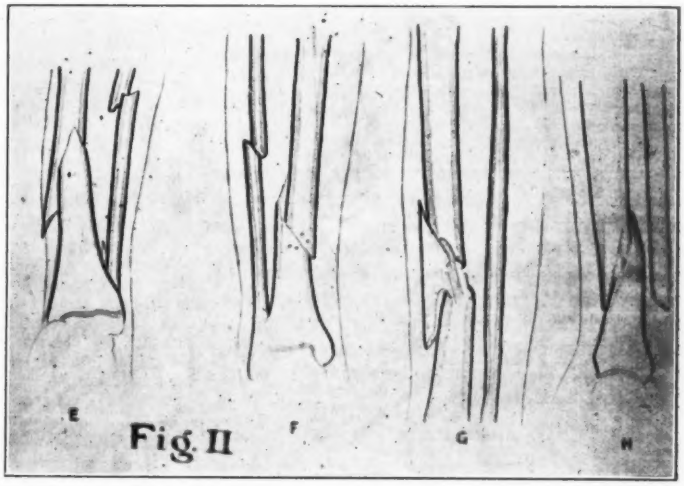

Fig. 2

Type E.—Wrapping of fracture ends with heavy kangaroo tendon held bones in excellent alignment.

Type F.—Drill holes in tibia with fixation by kangaro tendon.

Type G.—Bone fragment used as a graft fixed by wrapping kangaroo tendon around graft and shaft of tibia, similar to repair of broken spoke in buggy wheel.

Type H.—Fragments held together by methods similar to G.

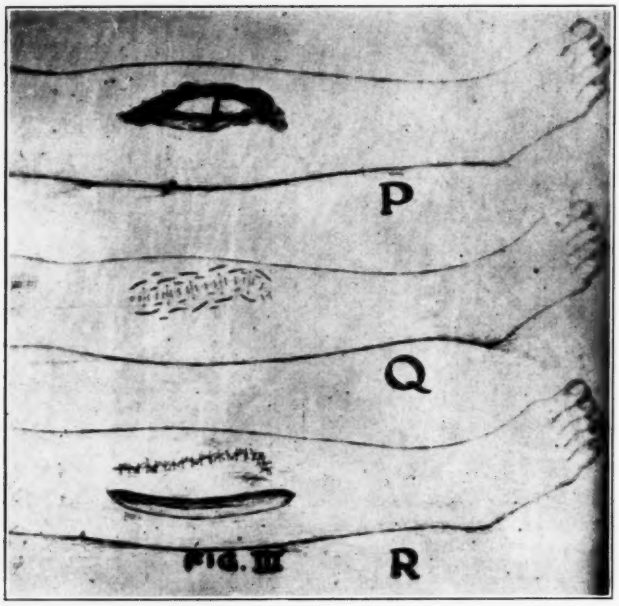

Fig. 3

Type P.—Usual type of wound of leg in compound fracture.

Type Q.—Method of closure by multiple stab incision in surrounding skin.

Type R.—The sliding of skin and fascia to facilitate closure. Wound over bone should be closed without tension.

plications such as indolent ulcers developing following closures. My observation as surgical examiner for the U. S. Veterans' Bureau has convinced me that the surgeon should give the greatest consideration to the situation of the scar on the leg to avoid one over the crest of the tibia. Too often an otherwise excellent result is marred by an adherent scar over the crest of the tibia, which is constantly being injured and ulcerated.

SUMMARY

All compound fractures should be thoroughly cleansed and the skin wound closed without drainage wherever possible.

Cumbersome and difficult methods of bone fixation should be avoided. The simplest and quickest method of apposition with the least amount of trauma should be used.

Traction as in simple fractures should be resorted to to maintain position in many of these cases.

The primary wound should be sutured without tension at all costs.

Delayed union was noted only once in one hundred cases. There was no case of non-union.

1102 Virginia Street

DISCUSSION (*Abstract*)

Dr. C. N. Carraway, Birmingham, Ala.—I should like to emphasize the extreme care that one must take in his first preparation of a compound fracture wound. In reviewing 1210 fractures at the Norwood Hospital and Clinic we found 74 compound fractures. We were able to convert sixty-three of these into simple fractures by cleansing and rendering as sterile as possible the compound wound at its first setting. Of the remaining eleven cases seven cleared up under efficient drainage. Four had a rather severe infection. In fact, three of them had gas bacillus infection, which necessitated amputation, with one recovery out of the three. The other four finally cleared up with proper drainage.

There has been a great revolution in the care of compound fractures. The general practitioner should not reduce a bone that is protruding, and should not introduce anything into a compound fracture, but leave it to the surgeon, and send the patient to the surgeon as quickly as possible. I believe at least 80 per cent of compound fractures can be converted into simple fractures. Success depends upon the first setting. Clean and remove the devitalized tissues and render the wound as nearly sterile as possible.

Dr. F. G. Hodgson, Atlanta, Ga.—In a private case, if the patient is perfectly clean and the fracture has occurred in a clean area, for instance in the house, you have much less chance of getting a severe infection than if you pick up a dirty little negro boy on the street, knocked down by an automobile, his bones having been ground in the dirt. Here there is danger of gas bacillus infection. Whenever possible one should sew up these wounds, close them and try to get primary union. We made it a rule in the City Hospital if there is any extensive destruction of skin or considerable contamination of the wound not to sew these cases up. They are cleansed as thoroughly as possible, the wound is packed with vaseline gauze, and a plaster cast is applied after they have been reduced and held still according to the method of Orr. No dressings are done unless the temperature rises and there is evidence of infection.

The essayist says he does a primary closure on cases coming in within the first twenty-four hours. I think twenty-four-hour cases are very apt to be contaminated. We do not try primary closure in cases which have been injured more than eight hours.

He speaks of drilling holes in the bones and fastening them together. I think we have to be careful of

spreading infection into the bone by additional trauma.

Also he speaks of cutting 1 cm. of bone away if it has become contaminated. If we cut away 1 cm. of bone from both fragments of a tibia we have considerable shortening of the bone and, perhaps, will get non-union.

It is an excellent idea always to cover the crest of the tibia, making lateral incisions, if the case is clean and there is no danger of infection.

Dr. J. R. Bost, Houston, Texas.—I have not been able to bring myself to close questionable compound fractures as the essayist has described. We are all approaching this type of treatment. We are doing less draining than we did a few years ago, but invariably if the case is at all dirty or we are at all in doubt we put in tubes, and, of course, do the usual cleansing of the wound.

We have many gunshot wounds among our negroes and Mexicans. I probably see more compound fractures from gunshot wounds than from any other cause.

We have been leaving our gunshot wounds alone, if we are sure there is nothing in the wound, and we have been getting better results than we did when we monkeyed with them. Probably, if we go further with our compound fractures we will find that we get the best results when we leave them alone.

I am getting away from skeletal traction more all the time. In simple fracture of the femur I find adhesives much more satisfactory and more comfortable to the patient. There is no fear of infecting bone from the traction.

I do not put anything inside if I can hold the fracture in position with traction, not even absorbable material. I never use non-absorbable material if there is any possible way to get along without it. We have gotten almost entirely away from non-absorbable material.

Dr. H. Page Mauck, Richmond, Va.—Much damage is done to soft tissues by the chemicals that we use, so-called antiseptics. In our own practice we clean the wound by pouring into it after the blood has been removed a simple antiseptic, and then we wash thoroughly with normal saline. That is all the chemical treatment that our compound fractures get.

I have never felt safe about closing cases which had extensive sofe tissue injury. In cases of extensive muscle injury the skin is very often overlying the muscle. If we put additional tension on the case we will get a slough. It is difficult to cover the front of the tibia in compound fractures of the tibia, and yet I have a hesitancy in making lateral gashes of any length over tissue which looks as if its circulation were not good. I would rather save some of the tissue than cut a part of its circulation. If one makes a left bilateral incision, puts tension on that, and eventually gets a slough, the exposure is greater.

Dr. J. Albert Key, St. Louis, Mo.—When compound fractures are seen early they should be thoroughly cleansed and closed. In the War we learned to consider a bullet wound due to a high velocity projectile as a simple fracture. On the other hand, shell or shrapnel wounds were treated as compound fractures. Most of the bullet wounds in civil life are due to high-powered projectiles. I do not think that they should be considered in the same category as the compound fractures which the essayist was talking about.

In treating compound fractures I debride the wound thoroughly, removing all badly damaged tissue, and then wash it out with salt solution, warm but not too hot, for fifteen minutes by the clock. All loose bone fragments and those which have not enough periosteum attached to them to assure nutrition should be removed. It is better to get mal-union than to risk putting any foreign material, either absorbable or non-absorbable, in a compound fracture which you expect to close.

It is very important that full thickness of the skin should be brought over the surface of the tibia. For that reason I use the same type of lateral incisions, and I do not hesitate to make them as long as I want them and to spread them as much as necessary.

The last thing that I do is to put in a drain, because I feel that these fractures should be drained for at least forty-eight hours.

Dr. Henson (closing).—Many of you know from experience that wounds received in coal mines heal nicely because they are not contaminated in the same sense that war wounds are contaminated. I do not hesitate to close a coal miner's wound twenty-four hours after the accident. With a case picked up on the street it is different. With adequate first aid rendered soon after the accident the time element is not so important.

The solution used in compound fractures should not be irritating to the soft tissue. The long washing mentioned by Dr. Key I have not carried out. The point I tried to stress was the careful closure of the primary wound and its protection by making multiple stab incisions around it. Whenever possible the fracture should be stabilized by the simplest method possible. Too much time is lost and too much additional trauma is produced in the surgery of this class of injury.

SERIAL PYELO-URETEROGRAPHY*

By ABRAHAM MATTES, M.D.,
New Orleans, La.

By serial pyelo-ureterography is meant the taking of roentgenograms of the upper urinary tract in such sequence as accurately to demonstrate the functional ability of kidney pelvis and ureter. Anomalies and abnormalities of both structures are more clearly recognized by this procedure. A routine gastro-intestinal series as contrasted to the older methods of diagnosis in gastro-enterology bears a striking relationship to serial pyelo-ureterography in urology.

It is my purpose to show that functional disturbances of the renal pelvis can be clearly diagnosed by time pictures; also that retention of opaque media is always associated with the presence of signs and symptoms.

The literature of recent years has added little to our knowledge of this subject. The lack of

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a standard technic has given rise to faulty interpretations. As a result there exists no definite basis for a proper correlation of findings amongst the various clinics.

Frontz's conclusions regarding the diagnosis of stricture of the ureter are faulty. Pyelo-ureterography would explain his failure to know why hydro-ureters and hydronephroses give indefinite findings in his x-ray studies.

Lower and Belcher, in their x-ray study of ureters, use two catheters, one to the site of obstruction and the other above it, in differential ureterography for stricture of the ureter. It is a novel method, but serial pyelo-ureterography gives more detail and causes less trauma.

Cole stressed the fallacy of placing dependence on the value of angulations in flat plates and proved that some kinks are not kinks at all. By its dependence on the presence or absence of stasis, serial pyelo-ureterography prevents these elements from disturbing the mind of the investigator.

Legue and his coworkers believe that hydronephrosis may be a neuro-muscular disturbance of purely adynamic origin, and they suggest anti-spasmodic therapy. It seems to me that hydronephrosis is associated frequently with such a disturbance in the uretero-pelvic area, and that dilation and anti-spasmodic treatment are indicated. If no relief is afforded surgery is of great benefit.

Intrapelvic pressure determinations (Kreutzmann) are of value in some cases. Where the pressure is high anti-spasmodic therapy is indicated, and where it is low the use of strychnine and like preparations. Ureteral dilation should always be used.

Eisendrath stressed the value of bilateral pyelography and pyelo-ureterography, but did not mention ureteral or pelvic stasis as determined by time pictures.

There are many methods of injecting the pelvis and ureter. All methods aim at the determination of the presence of stone, tumor, infection, tuberculosis, a pyo- or hydro-pelvis, a pyo- or hydro-ureter, stricture of the ureter, and other anomalies and abnormalities of kidney and ureter. An occasional urologist may take an x-ray picture several minutes or longer following his study of the plates, at the time of examination, to check back on his case. Another may want to note if the opaque medium is still present. None has adopted the routine of x-raying his cases after a certain stated interval, especially where the usual abnormalities are known not to exist.

The method suggested by Mattes in 1926 forms the basis of the present study. All cases were seen in consultation at Charity Hospital and invariably disease of the pelvic organs, appendix, gall bladder, and gastro-intestinal tract had been ruled out or was only mildly considered as a diagnosis. Symptoms varied from typical attacks of renal colic to gastric distress and other gastric symptoms; pains in the flank, radiating pain to the bladder, down the thighs and legs; pain across the back; fullness in the side, and general abdominal aches. The findings indicated the urinary tract to be the major offender.

The bladder urine was usually negative except for a few red blood cells. Ureteral catheters Nos. 4 and 5 passed easily to the pelvis in most cases. Aspiration of the catheter gave less than 2 to 3 c. c. of urine as a rule.

Technic.—With catheters *in situ*, the first x-ray picture is made. This outlines the course of the ureter and its relation to the kidney and other structures, as well as any abnormality that would cast a shadow. The second plate follows the injection of 3 to 4 c. c. of 25 to 40 per cent sodium iodid solution. The catheters are blocked to prevent the escape of media. This picture outlines the pelvis and the ureter, when there is leakage alongside the catheter.

The third picture is taken following the simultaneous withdrawal of the catheter and injection of 1 to 3 c. c. of 25 to 40 per cent sodium iodid solution. This picture outlines both renal pelvis and ureter, and occasionally the bladder. Hyperactivity of the ureter is here noted by the absence of a shadow along its course.

A fourth picture is taken in the same supine position five minutes later. This picture gives the degree of stasis in pelvis and ureter and at times the outline of the bladder. Occasionally more plates are taken at longer intervals, as in hydronephrosis. Abnormal conditions of the uretero-pelvic area are clearly seen and easily recognized if they are present in several films. A stricture of the ureter will always show a retention of opaque media if drainage is faulty. This retention may be confined to the ureter alone, or may include the pelvis and the caliceal system.

Hunner and others have impressed us with the importance of the presence of stricture of the ureter, its pathology, symptomatology, and diag-

nosis. Diagnostic methods so far deal with the behavior of instruments going up the ureter, or the hang of the bulb on withdrawal. Ureterograms are variously interpreted by different observers. Even when pyeloscopy and ureteroscopy are done not enough consideration is given to the ability of the upper urinary tract to empty itself of media injected. Angulations and spasms give false interpretations and are responsible for many a faulty diagnosis. The passage of large calibrated instruments or bulbs is dangerous to the well being of the patient and is followed by reactions in the ureteral wall which counteract all the good that is done.

It is not of importance what sized instrument can pass up the ureter, nor where there is a hang on withdrawal. It is of importance that the pelvis and ureter shall drain properly. The condition of the ureter is no criterion of its functional ability. Both pelvis and ureter should be studied in terms of output, to determine whether drainage is within normal limits. This can be done only by serial pyelo-ureterograms or by pyeloscopy.

In a few of the cases to be presented, no abnormality was noted other than five minute stasis in the pelvis of the kidney. This is caused by some condition at the uretero-pelvic area, or by an atonic state of the pelvis. The tone of the pelvis may be temporarily lost, permitting dilation and stasis. This condition can be likened to cardiac neurosis and functional disturbances of the heart; likewise to similar conditions of the stomach. Legue's views are in accord with the above statements.

Ureteral dilation, using catheters or bougies, Nos. 5 to 10, usually Nos. 6 to 8, suffices in the average case to provide a lumen in the ureter that will give normal drainage. Periodic dilation is accompanied by an amelioration of symptoms or their complete disappearance. When no results are noted another urographic study may show a persistence of pelvic stasis. This can be remedied only by surgical intervention. Pyelo-ureteroplasty in future years will be as common an operation as gastro-enterostomy, being indicated when stasis is persistent.

There were 328 cases seen in consultation and cystoscoped at Charity Hospital from January, 1927, to July, 1928. Bilateral pyelo-ureterograms were made in 140 cases. Five-minute stasis were noted as follows: 17 cases showed right pelvic stasis; 6 left pelvic stasis; 17 bilateral pelvic stasis; 1 left ureteral stasis; 2 bilateral ureteral stasis; 9 bilateral ureteral and pelvic stasis; 8 right pelvic and ureteral stasis; 2 left pelvic and ureteral stasis; and 1 right pelvic and ureteral and left pelvic stasis. Or of 140 cases subjected to urographic study, evidence of moderate to considerable five-minute stasis was present in 63 cases, or 45 per cent. In a fair number of the remaining 55 per cent, ptosis, tumor, stone and stricture were noted.

Stricture in these cases was associated with good drainage. When drainage is normal at the time of examination, impairment of the urinary tract should not be ruled out. If symptoms are present and other organs apparently are normal, and there is difficulty in passing a catheter, there is stasis, but of an intermittent nature. The history, cystoscopic data, and urographic study are necessary in every case for a diagnosis.

CONCLUSIONS

Serial pyelo-ureterography offers a method of diagnosis in many abnormal renal and ureteral conditions that would ordinarily escape detection.

Non-opaque ureteral calculi can be visualized by this method. Several plates are necessary with gradual withdrawal of the catheter and injection of opaque media at different levels.

Bilateral pyelo-ureterography gives information as to the status of the opposite side, which is always valuable, irrespective of findings.

Functional disturbances of the renal pelvis can be diagnosed only by serial pyelo-ureterography. Pyeloscopy is ideal for diagnosis, but offers too many difficulties for the average worker to be universally used.

CASE REPORTS

Case 1.—Taylor Lirrette, a white male, age 19, was admitted to the hospital June 19, 1927, with the tentative diagnosis of appendicitis. He complained of pain in the right lower quadrant and along the right iliac crest, radiating upwards posteriorly to the area below the ribs in the mid scapular line. With this there was nausea but no vomiting. The first attack began two years before. Since then attacks had occurred at monthly intervals. There was no urinary disturbance, and urinalysis was negative. The Wassermann test was negative. Examination elicited tenderness over the whole right side.

Cystoscopy was done June 22, 1927. A No. 5 catheter was passed to each pelvis with no difficulty. Aspiration gave no residual urine. Serial pyelo-ureterography showed bilateral pelvic five-minute stasis, with dilation of the pelves, right ureteral stasis from the sacrum upwards, and constrictions at both uretero-pelvic areas.

The patient left the hospital free of symptoms and was instructed to return for dilation. He returned

Case 1, Fig. 1. T. L., Catheters in pelvis.

Case 1, Fig. 2. Bilateral pyelogram.

Case 1, Fig. 3. Pyelo-ureterogram.

Case 1, Fig. 4. Taken five minutes after Fig. 3. Note stasis in each pelvis.

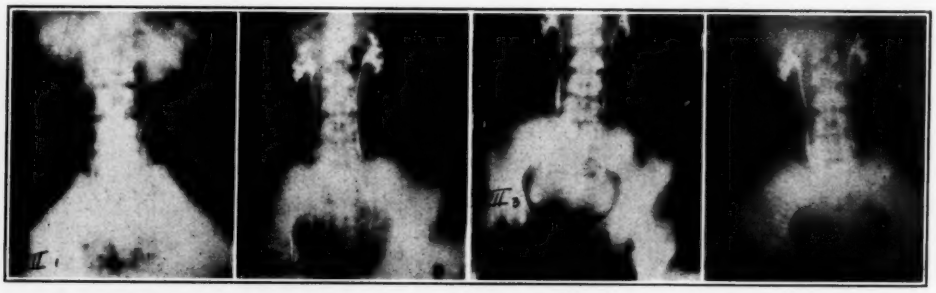
August 13, 1927, stating that he had remained well for a month. He was cystoscoped and a No. 6 catheter was passed up each side with no difficulty. There was no stasis. He returned September 2, 1927, free of all pain. He was cystoscoped, and a No. 5 catheter was passed up each side. On the right side there was no stasis; on the left 5 c. c. of fluid was obtained. He was instructed to return for further dilation, but failed to do so.

Serial pyelo-ureterography enabled us to arrive at a correct diagnosis of the condition of his right ureter and pelvis, and the bilateral method disclosed disease on the left side that otherwise would have escaped detection.

Case 2.—Miss I. L., a white girl, age 18, was seen in the clinic complaining of pain in the right lumbar region. An appendectomy two years before had given relief for only three months. There was pain on pressure over the right lumbar area. Cystoscopy was performed on January 11, 1927. A No. 5 catheter was passed up each side with no difficulty. Pyelo-ureterographic study showed bilateral ureteral and pelvic stasis from the meatus upwards. A severe reaction followed. She passed some bloody urine. She returned to the hospital two days later with partial anuria, and lumbar pains and severe pain in the lower right quadrant. She vomited frequently. There was suppression of urine from January 13 to 15. A catheter inserted in the bladder showed no urine there. As the blood chemical findings were normal, she was left alone by the urologist in charge of her service.

January 16, 1927, she was cystoscoped by Dr. P., and four ounces of urine were obtained from the bladder. The right ureter was catheterized with difficulty, the left with ease. No notation was made as to the size of the catheter used. Clear urine was obtained from each side. On aspiration 20 c. c. of bloody urine were obtained from each side. Her physician lavaged the kidneys with weak adrenalin, leaving some in each pelvis. He detected a good flow from the left side, but none from the right. She was discharged improved, but not voiding freely, on January 20, 1927.

I am firmly of the belief that bilateral pyelography had little to do with this case of anuria. I have seen similar reactions follow simple catheterization. Legue reports that he has had to go back and leave catheters *in situ* in at least 3:500 cases. This case was seen at different intervals by the same urologists, was re-admitted June 27, 1927, and died following a right pyelotomy September 16, 1927. This was done on account of reports of increasing blood chemical findings and anuria. She was cystoscoped by several on the staff with varying success, and with practically no relief the last few times. The diagnosis was stricture of both ureters about 4 to 5 inches up each side. Her non-protein nitrogen on September 16 was 250 mg.

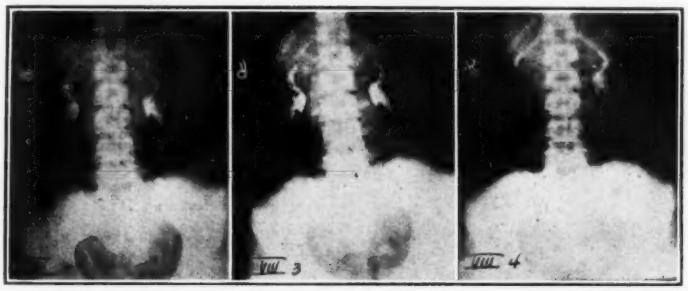


Case 2, Fig. 1. Catheters in situ.

Case 2, Fig. 2. Each pelvis injected.

Case 2, Fig. 3. Note complete bilateral pyelo-ureterogram following withdrawal of catheters.

Case 2, Fig. 4. Note five-minute stasis from the meatus upwards.



Case 8, Fig. 2. Note bilateral pyelogram.

Case 8, Fig. 3. Pyelo-ureterogram. Note rapid emptying of left ureter.

Case 8, Fig. 4. Five minutes later. Note stasis in left renal pelvis.

The patient's mother later informed the intern that her daughter had taken bichlorid of mercury tablets in December, 1926. What bearing this had on the case is problematical. The presence of bilateral stricture at the time of examination is undoubted. The failure to leave both catheters in place at the time of catheterization following the first anuric state is, to my mind, responsible for the subsequent course, as much as the irregularity of attendance of the patient. Again, I believe a closer co-operation between patient and cystoscopist would have greatly benefited the patient.

Case 8.—Emma Picard, a colored woman, age 22, was seen on March 17, 1927, complaining of pain which had existed in the left kidney area for one year. There were no bladder symptoms. Her past history was negative. Cystoscopy showed a reddened left ureteral meatus. A No. 6 catheter passed up each side with no difficulty. There was no stasis. Pyelo-ureterography showed the pelvis to be moderately enlarged on the right side, with good drainage, and on the left a moderately enlarged pelvis, with dilatation of the lower calyx and distinct five-minute pelvic stasis. Urines from the bladder and from each side were negative.

This patient did not return for treatment.

Time pictures in this instance enabled us to make a diagnosis that satisfactorily explained all symptoms. It is in cases of this type that serial pyelo-ureterography gives valuable information.

Case 9.—Jesse Nelson, a colored man, age 30, was seen June 8, 1927. For two months he had had chills and fever. Ten days before our examination he developed cramps in the lower abdomen and had been in bed the entire time since. There were no urinary symptoms. The Widal test was negative. His past history was of no significance. On cyscopy, June 8, 1927, the meatus were seen to be injected. A No. 5 catheter passed up each side with no difficulty. There was no stasis on the right side; on the left side there were 3 c. c. of urine. The urines were negative for tubercle bacilli, and showed no pus. Serial pyelo-ureterographic study showed bilateral stasis from the meatus upwards, including the pelvis. Constriction of the lower end of the ureter was noted on each side.

June 30, 1927, a No. 6 catheter was passed up each side with no difficulty. There was no stasis on the right side; on the left there were 3 c. c. of urine. The bladder and kidney urines were negative.

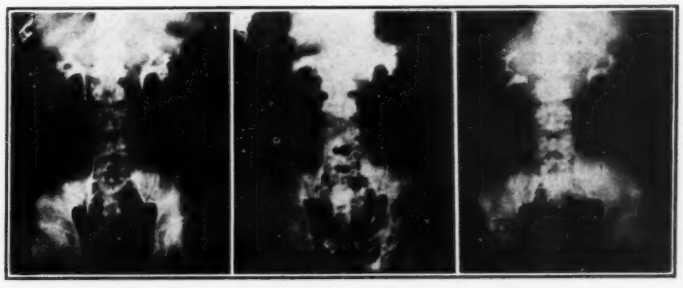
July 9, 1927, a No. 5 catheter was passed up each side with no difficulty. On the right side there were 2 c. c. of urine; on the left none.

The temperature went down June 16, 1927. June 19 he was improved. June 21 he had no temperature. June 28 he was doing well. X-ray of the chest and some lung findings suggested pulmonary tuberculosis. The sputum was negative. Blood chemical findings and Wassermann were negative. There were 9400 leucocytes, with 82 per cent neutrophils. He was discharged from the hospital July 11, 1927, greatly improved and free of fever. He was instructed to return for further dilatation, but did not do so.

Treatment caused a cessation of symptoms and lowering of temperature. Stasis can cause elevation of temperature when infection is not present. In the absence of urinary findings a careful history will prevent many an incorrect diagnosis.

Case 12.—Mrs. E. Pontiff, a white woman, age 19, was admitted to the hospital on June 18, 1928, complaining of pain in the right side, along the course of the ureter and right kidney area. She had been in the hospital the previous year for three weeks for pyelitis. At that time she was pregnant and an abortion was done. There was no history of cystoscopy. The urine was negative.

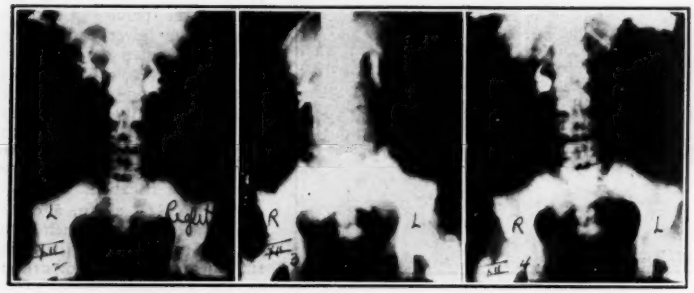
June 21, 1928, a No. 5 catheter was passed up each side with no difficulty. Less than 2 c. c. of fluid were obtained from the right and left sides. All urines collected were negative. Serial bilateral pyelo-ureterography showed five-minute stasis in the pelvis of the right kidney and constriction at the uretero-pelvic area. The left side was negative. Upon vaginal examination a small cystic right ovary was noted, not sufficient to cause trouble or warrant an operation.



Case 9, Fig. 2. Bilateral pyelogram.

Case 9, Fig. 3. Pyelo-ureterogram after removal of catheters.

Case 9, Fig. 4. Five minutes later. Note bilateral pelvic stasis.



Case 12, Fig. 2. Pyelogram.

Case 12, Fig. 3. Pyelo-ureterogram. Note rapid emptying of left ureter.

Case 12, Fig. 4. Taken five minutes later. Noto complete stasis in right pelvis, with uretero pelvic area disturbance.

She was discharged from the hospital on June 23 and instructed to return for dilation. She did not do so, but returned to the hospital on July 6, 1928, with the diagnosis of stricture of the right ureter. The urine contained pus cells and some red blood cells. She remained in the ward seven days. The chart fails to show whether she was cystoscoped or not.

Here is an undoubted case of a neuro-muscular disturbance of the right uretero-pelvic muscle that would have responded well to treatment, both medical and mechanical, if there had existed a spirit of cooperation between patient and urologist.

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DISCUSSION (*Abstract*)

Dr. Earl Floyd, Atlanta, Ga.—This information is new. The only articles on the subject familiar to me are those of Dr. Goldstein, who showed that the normal emptying time is between four and seven minutes. Later he reported that the emptying time in certain pathological conditions is greatly delayed. My experience has been small, but it indicates that the emptying time with normal kidneys is about five minutes. In pathological conditions it is delayed sometimes as long as three or four hours. In one case I felt that it was necessary to drain the fluid off, for none or very little of the solution had passed down in four hours. I believe we have in serial pyelo-ureterography a possible solution of many difficulties.

The most frequent cause of stasis is stricture, and stricture must be differentiated from conditions that were formerly diagnosed as stricture. A narrowing which is beautifully seen in some pictures may on further examination not be present at all. It may be due to a wave or spasm at the time the picture is taken. Serial pictures are of great value in determining this.

Another point brought out in the paper is that stasis does not depend upon the capacity of the pelvis. Some kidneys with a small pelvis may have a much longer retention than those with larger pelves. Some of us may think that because the capacity is normal stasis is not present. A series of pictures in such cases may be very useful.

Dr. Courtney W. Shropshire, Birmingham, Ala.—I believe that spasms could be diagnosed more conclusively if the pyelograms were taken on different dates. Spasm may remain present for a little while.

Difficulty with this method is the additional cost of the serial plates. Different clinics figure the actual cost of overhead and technicians at about $6.00 a plate, and they charge about $15.00 for the picture.

The patient must undergo considerable exposure to the x-ray in the extra pictures if the work has to be checked. There is a question whether there would be any danger in the additional amount of x-ray.

Dr. Mattes called attention to the floating kidney, but I did not notice that he called attention to the position of taking pyelograms for floating kidney. If the patient is in the prone position it is almost impossible to get a proper excursion of the kidney. We have been using a certain technic in taking plates of floating kidneys. The table is put in an extreme Trendelenberg position, the plate is taken, and then a reverse Trendelenberg position is taken directly opposite, and you can see how the kidney has dropped down. Would serial uretero-pyelograms show anything more definite than this, if the patients were not placed in different positions?

Dr. David M. Davis, Baltimore, Md.—It occurred to me some time ago that in the making of these ureteropyelograms we might be assisted by fluoroscopy. I constructed, with Dr. Stafford Warren, of Rochester, New York, an apparatus that permits fluoroscopy and pyelography at the same time. It is a combination of the ordinary fluoroscopic and cystocopic x-ray tables, having a separate top that operates on rollers. This top can be pushed back and forth from one table to the other with great ease. This enables us to make the cystoscopic examination and insert ureteral catheters on the cystoscopic table, then check with the fluoroscope

to verify the position of the catheters and watch the filling of the pelvis. Then the picture can be taken, using the Bucky diaphragm. After withdrawing the catheters the emptying of the pelvis can be observed with the fluoroscope. In this way we are enabled to take the serial pyelograms at the proper moment. It also limits the expense, since films are taken only at the moment that seems most desirable. The details of the apparatus will be published very soon.

Dr. H. W. E. Walther, New Orleans, La.—If we all had the advantage of Dr. Davis' apparatus we should have an ideal method, but most of us have the choice of a fluoroscopic study or of making the films. Fluoroscopy is all right on our own patients, but we have many consultations with medical men and others who want to see the pictures. Some of them cannot be present for a consultation on all cases, so I think the uretero-pyelograms are better.

Dr. Mattes mentioned the importance of withdrawing the ureteral catheter during the work to show the ureter. This is not sufficiently emphasized anywhere. We see picture after picture thrown on the screen showing the catheters in place, and we do not see the outline of the ureter, where disease very frequently occurs. We must withdraw the catheter almost to the bladder before making the picture, then we can make one picture and five to seven minutes later make a second one. None objects to withdrawal of the catheter on account of pain and suffering. Rarely do we remove the patient from the cystoscopic table immediately after taking the picture. He rests there for fifteen or twenty minutes. The sodium iodid solution is always warmed before using.

You are familiar with the work of Felix Legueu, of Paris. He showed the wave-like action of the ureter and renal pelvis following the introduction of the opaque media. A distention of the calices, when they are extended to maximum, will show contracture within the pelvis. At the next moment, when the wave swings, the calices are relaxed and the pelvis is taut. I have found this true in all cases. Serial urograms have their place.

We should do more work with the catheter out of the ureter at the time the picture is made. I pull the catheter at least half way down the ureter; then instill the solution gently, pulling the catheter out just before the roentgenologist snaps the picture. A second picture is made five to seven minutes later.

Dr. W. J. Wallace, Oklahoma City, Okla.—I find bilateral plates very much more effective and satisfactory than a unilateral picture, unless there is some contraindication in the patient's kidney condition. We cannot be too careful in investigating the general condition of the patient before we attempt pyelography.

After my first picture has been made I raise the patient into the erect position and have him remain there several minutes, to determine whether or not there is a general ptosis.

In my earlier work I had several cases of suppression of urine which frightened me and caused me to be very cautious and guarded when making pyelographic examinations. In certain patients, especially the older ones, it is hazardous to make this combined examination at first. In the first examination of these particular cases I very frequently only pass the catheters, collect a specimen of urine, make a functional test and take a radiogram. At a later date, when the patient is able, I make the uretero-pyelogram. I have thus been able to avoid urinary suppression.

Dr. R. E. Van Duzen, Dallas, Texas.—I have treated patients whose urological examination was negative by our present standards, who claimed they were relieved of their symptoms a few days after treatment. I have used belladonna with partial success in this class of cases. Many of these are patients on whom radium has been used for dysmenorrhea, uterine fibroids, and so forth, and who have had artificial menopause. Others give a history of dysmenorrhea throughout life. I used pituitrin in some cases, and in others polyglandular extract (Empco) with better results. I believe a polyglandular extract is unnecessary, but do not know which of its ingredients are necessary.

I do not believe that Dr. Mattes can distinguish between atony and stasis by aspiration. I prefer the therapeutic test. We may not have both conditions in the same patient.

Dr. Mattes (closing).—I am acquainted with the work of Dr. Goldstein, but doubt that he examined for filling defect at the uretero-pelvic area, nor did he determine the value of stasis in pyelography. Spasm is important. Where there is spasm there is stasis. If it is present at the time of the examination there will be symptoms. We find difficulty in getting the patient's consent to make pyelograms on different days. There is no difference in private practice in the price of several plates. The charge is $15.00 for a set, no matter how many. I have never been criticised for taking them, even at the Charity Hospital. I think the exposure to the x-ray is not dangerous. I have been informed that eight pictures may be taken, but I have never used more than seven.

The table Dr. Davis mentioned I think would be excellent, and am interested to know of it.

We have found in our work that it was quite disturbing to have a patient dragged around to determine the descent of kidney, and we concluded that it made no difference what position the patient was in as long as we maintain a standard year after year. The descensus of the kidney has nothing to do with diagnosis, nor do I consider it of any value. It is stasis and drainage that we are interested in. This can be determined with plates taken on the flat. All pictures are taken in the supine position.

We have been using stimulating treatment and glandular extracts. They should be used, but even in these cases, and in spite of dilatation, stasis will sometimes persist. Then the use of the Dourmashken bag passed to the pelvis of the kidney will give relief.

THE DESIRABLE MEDICAL STUDENT*

By KENNETH M. LYNCH, M.D.,†
Charleston, S. C.

What one believes to be the desirable qualities of a medical student depends upon one's observation of the profession at work, and one's ideas as to the desirable and the undesirable qualities and attributes displayed by its members.

There are two broad and general criticisms to be made of the practising physicians in this Country. First is that of shortness in analytical thinking, in depth. Second is what may be called the commercial spirit. The first condition is improving, the second is probably growing worse.

The reasons for the first condition are several. There are the inherent characteristics of the individual, the kind of training he received before he entered medical school, and the character of training in the medical course itself.

To prevent the entrance of students inherently disqualified by shortness in analytical brain power necessitates very careful selection, particularly closer personal study and selection. We constantly encounter in our classes students who have met the scholastic requirements fully and perhaps with something to spare, who fail to progress because of a lack of thinking power. It must be someone's business to form this judgment before the prospect enters.

Poor training in analytical thinking in the graded schools, high schools, and colleges, is a condition which we must continually force upon the attention of general educators. Of course, in some schools it may be good, in others it is bad. Stimulation to learning is woefully lacking in many, and I am thinking particularly of the graded schools. It seems that habitually the aim of the student is to avoid rather than to acquire. Habits thus established in early school life are vicious and difficult to break. A particular criticism to offer is of the system by which mediocrity is rewarded and aptness handicapped. One cannot but agree with President Lowell, of Harvard, in his argument with the school teachers. Certainly there should be some means by which merit may be recognized and allowed to progress instead of being pulled down by the weight of the sluggard. For those with talent and ambition there should be opportunity for more rapid progress; they should not have these qualities buried or killed by the system which governs progress of the classes by the ability of the dull witted. The good should be separated from the poor and allowed to proceed. We need them for higher education and the higher walks of life. Instead, they are forced to waste their time and to develop wasteful and ne'er-do-well habits.

Even at the age when the student reaches us we can do much toward stimulating the analytical mind. The medical curriculum has been improved in recent years with this in view. More of the kind of teaching which induces him to find out facts for himself and less of spoon feeding is desirable. We still attempt to stuff him with an assorted allotment of facts and judge him on the basis of how well he memorizes them, instead of guiding him in the ways of analyzing and interpreting the observations which he is allowed and induced to make. The most desirable medical student is not always the one who best retains the information necessary to pass examinations and make good marks. We see that too often illustrated.

An analytical frame of mind built up to considerable maturity is essential to entry in the study of medicine, essential to a proper grasp of the medical curriculum, and to the kind of practice of medicine which we desire.

A certain degree of maturity of thought is of considerable importance, and it appears that we are now in some danger of making a sacrifice here in the modern hurry to get students of medicine through the curriculum, through their training, and out into productive activity. I am not convinced of the necessity or advisability of getting boys into the practice of medicine. In fact, I doubt that it is an advantage to anyone to place new practitioners in the field under thirty years of age, even though it may be an economic necessity. I doubt that any but the very exceptional individual is capable of assuming the responsibility of the care of the sick under that age. I am not particularly concerned about the time now used in preparing a physician to practise. Rather, I would make it most difficult for any one to assume practice in the twenties. I believe that the practice of medicine is a mature man's business and that mastering the medical curriculum requires a certain degree

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†Professor of Pathology, Medical College of the State of South Carolina.

of maturity and that these stages of maturity of the mind come ordinarily at certain ages.

Consequently I find myself in a measure out of harmony with some recent movements to cut short schooling, so as to place physicians in the field in their early or middle twenties. It seems to me that we are thinking of undoing in some degree the admirable parts of the program which resurrected medicine in this Country in the present generation.

I agree thoroughly with the growing practice of personal selection of matriculants, but when we have selected a good man why not give him the full opportunity to mature? A good man will be a good man, regardless of his schooling preparatory to medicine, or, as a matter of fact, regardless of the excellence of his medical curriculum. We have too many concrete examples of that fact among our present faculties and leaders of medicine. But would he not be a great deal better man with a well rounded and completed university education? Instead, some of us are thinking it would be better to hand-pick our students and then rush them through an arbitrarily set array of minimal training tasks, with the object of placing them in position to make a living in the shortest possible period of time. Is that professional education or is it more the order of training for a trade, training to do a certain set of pieces of work by rule? Is that conducive to creative and imaginative endeavor or does it tend to limit one to following certain prescribed practices? Does it tend to stimulate the principle of service, without which medicine is stripped of its power for good, or does it encourage the habit of self interest? Is it not in line with the tendency, already criticized, of medicine toward commercialism?

I find no urgent reason for haste in medicine. Rather, I would slow us up and give the opportunity for plumbing greater depths. Medical progress has spread laterally out of proportion to its height and depth.

I find some excuse to make the connection here with certain other practices which are gaining attention, among which is that of apprenticing medical students to practitioners before graduation. Here we encounter the old practice of reading medicine. This practice is not within itself bad. It is about the time and place and conditions that we need to exercise care.

Is it desirable that the student should be thus thrown into the practice of medicine, for call it what you may, it is the practice of medicine, before he has finished the course of study designed to precede such practice? Why should it now become desirable that he should enter into practice before completing the curriculum which is judged to be the minimal preparation for practice when that was one of the major faults found in medical education twenty-five years ago?

Does it not make of the completion of the medical course an anti-climax? Does it not tend to encourage in the individual as a student and then as a physician the very things which we have been struggling to eliminate? Should not the apprenticeship come after graduation, either before or after the hospital internship? That is where it has been and there, it seems, is its natural place.

As to the commercial tendency in medicine and its relation to the quality of medical students, I do not mean to say that the application of business methods in the practice of medicine is harmful. I am not advocating the old system where the mention of money in relation to medical service was forbidden. I believe that a physician should be well paid for his services. But it seems that it is growing more and more to be the habit that the first thought is the fee and the second the service to be rendered for that fee. Service is the main, if not the sole objective of the physician and that service well and unselfishly rendered will be well rewarded. The thought of the money to be made in the various phases of medicine is too prominent; it is almost if not quite dominant. Of course that is to a degree a part of the habits of the day, but it should be our object to keep the skirts of the profession free of commercialism. The student who prepares for medicine with the thought of the money to be made from it as his stimulus is not the most desirable candidate for the profession. Osler's greeting to the medical student:

> "If you have come here to study this profession because you believe it will be interesting and lucrative, please go home. If, on the other hand, you have come because you believe that in the practice of medicine you best can use your talents in the service of your fellow men, then we welcome you,"

should be the greeting of the medical school to its matriculants.

And yet we see them entering upon a medical career with the remunerative side as their sole interest. We see that inclination too much stimulated by the medical school itself. Let us con-

sider well whether this is not partly responsible for some of the newer experiments in medical education, the growing thought that we should get them out to making a living earlier. Why should this be an objective in medical education? Why should not the sole objective of the medical school be to prepare properly for entrance into the medical profession, regardless of the time it is necessary to use for that purpose?

That is idealistic; idealism fits and can be fitted into medicine beyond most other walks of life, and when we fail to put it paramount we fall short of meriting our inheritance.

As the desirable qualities in a medical student I would put first a certain high-mindedness, perhaps fundamentally inherited, nurtured by careful schooling. I would add to that an analytical mindedness, also inherited and similarly nurtured. Selection of students for these qualities must be, in some part, at least, by personal touch and judgment. To the individual possessing such qualifications I would give a well rounded preliminary education of a duration sufficient to allow considerable development into maturity of thought, without great concern about the time occupied. I would not throw him into contact with the practice of medicine too early. I would give him sufficient time to mature in the medical atmosphere, but not secluded from the world by occupying him week in and week out, day in and day out, with medicine. I would allow him plenty of time off for contact with the outside. Is not that what vacation time is for during the medical course? It is not for loafing and light play. It should be utilized for joining up the medical life with other walks, which the physician should know something about, and it should be given adequate time. When he is well developed in the medical atmosphere, matured in some high measure of thought, then there is plenty of time for his apprenticeship to a qualified practitioner. When all of this is done we shall have given to the public one who can assume the responsibility of entering its service in preserving and protecting health. We shall have produced a desirable prospect, we shall have led a mind into maturity and not simply a machine into economic productivity.

Discussion follows paper of Dr. Douglas, page 909.

WHAT CONSTITUTES A DESIRABLE MEDICAL STUDENT?*

VIEWPOINT OF A CLINICAL TEACHER

By BEVERLY DOUGLAS, M.D.,†
Nashville, Tenn.

It is a fact important to the discussion today that of the 17,959 students who failed to graduate from the medical schools of this Country between 1911 and 1925, 85.4 per cent left school by the end of the second year.[1] Assuming that the vast majority were forced to withdraw because of failure to meet requirements, this places the main burden of judging the desirability of the medical students as it is now done squarely upon the shoulders of the preclinical group of teachers. It means that as a rule only about 15 per cent of all undesirable students are stamped incompetent by the clinical teacher. In this a dilemma is involved. While the purpose of every great medical school is to turn out capable practitioners and teachers of medicine, men well trained in the broadest sense, yet the men who teach the last two years are having very little to do with passing upon the fitness of students for graduation. For obvious economic reasons they do not wish to fail a large number of students near the end of their course, and yet under existing conditions they have almost no opportunity to pass upon them earlier.

I realize there are many teachers of the first two years who have unusual ability and keenness in sensing those qualities which will make a student an outstanding physician or surgeon. Many of these men have even practised medicine. It stands to reason, however, that teachers and practitioners who are constantly confronted with the problems of patients should have a very large role in deciding upon the desirability or fitness of both applicants for entrance and of medical students. This is not at present the case.

"The practice of medicine," as Osler says, "is an art based on science."[2] In congratulating his students upon their choice of medicine, he tells them that it is a "calling which offers a combination of intellectual and moral interests found in no other profession and not met with at all in the common pursuits of life."[3] The reduction of more and more of its fields to exact

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†School of Medicine, Vanderbilt University.

sciences has in no wise altered the value of the art of the teaching and practice of medicine. It has only eliminated a few more of the "guessers" and "quacks." The really great practitioner of medicine, the really great teacher, is at a greater premium than ever because the field of medicine, while losing none of its great individual and human values, has been so broadened by preventive medicine and other fields as to include in everyday practice the health problems of the community. If our students of today are to become physicians and teachers of the highest order they must be able to understand the general and social, as well as the individual needs of human beings.

Obviously only a few men in our classes will have the capacity to become great teachers or great internists. I presume that this is the reason we are discussing today simply the "desirable" and not the "ideal" student. It would be the worst thing possible for medical education in this Country, if the schools chose men mainly for their high academic standing without due regard for personal qualifications. It would tend to destroy initiative and scientific zeal and to reduce personality to a fixed and low minimum. How many of the men termed "ideal" by admission committees, men with wonderful scholastic records, fade more and more into insignificance as the end of the fourth year rolls around?

If as medical teachers we see to it that well defined standards of judging men are upheld throughout the course, the general level of desirable students will be raised. Likewise the men with the greatest capacity for measuring up to these standards will become real leaders in the broadest sense of the word.

From this viewpoint what particularly are the qualities which will make a medical student desirable? There is a sameness about the answer of nearly every medical man when he is confronted with this question. His thoughts will almost invariably find expression in the terms, "intelligence and character." These are the qualifications which our new sister medical school at Durham, North Carolina, intends to use in selecting all students,[4] and they are hard to improve upon. However, for the purpose of our present discussion it is necessary to define both of these basic qualifications more specifically.

Throughout the entire medical course a well prepared mind will constantly prove its value. It is hardly advisable to spend time here discussing the type of premedical courses which properly prepare a student for anatomy, chemistry, and the other preclinical branches. Suffice it to say that the preclinical teacher finds out all too often that an "A" man in college lacks the real essentials in his particular subject, and I speak from the cultural as well as the technical viewpoint. This is one phase of the problem which I feel should be left to the discretion of the preclinical man on the entrance committee.

The well prepared mind is even more essential to the clinical teacher than to the anatomist or pathologist, for in the last two years the student, if he is to have any degree of proficiency, must be able quickly and surely to take hold of a great variety of findings and transform them into single disease entities. His mistakes will here often be costly because they will directly affect human life and human happiness. The work at the bedside will require an accurate, critical knowledge of fundamentals.

In addition to a well-prepared mind, another indispensable attribute of a desirable medical student is intellectual curiosity. It is veritably born with some men and in others it comes late when the deeper significance and beauty of life stirs their imagination. Wherever we find it let us regard it as a "jewel of matchless worth," and as such stimulate and guide it with our more mature judgment.

We all know the story of Osler about a certain class of his medical students.

> "The question came up one day when discussing the grooves left on the nails after fever how long it took for the nail to grow out from root to edge. A majority of the class had no further interest, a few looked it up in books, two men marked their nails at the root with silver nitrate and a few months later had positive knowledge on the subject."

A student with this rare quality of intellectual curiosity is likely to succeed if he has will power to back it up, for his very approach to medicine will be largely his own. His constant desire to know the truth will lead him along fascinating paths through every step of which he has blazed trails for himself too deep to be erased and always ready to be retraveled with confidence. In the end his knowledge will be far more real and enduring than that of one who has followed the humdrum routine of acquiring knowledge. Even if he misses his exact goal at times, his "search will be crowned with courage" and he will "find along the path a rich reward of unexpected things."

In the third and fourth years all of us as teachers like to see a man apply the knowledge he has gained to the solution of the everyday problems he finds in the clinic. The kind of intelligence which will enable a man to apply his knowledge of bacteriology, for instance, to the treatment of wounds stamps a student as one of unusual promise for a medical career. It reflects credit upon the teachers who have been responsible for his early training.

I can speak only very briefly of habits which I feel every student should be urged to acquire even before he enters medical school. One is that of the intelligent use of works of reference. A medical student, to develop into a really successful man, must know how to use a library and must use it, constantly. I shall never forget what an example the late Professor Halsted made of a practitioner who had once been in his class in surgery. The man had just written him that he had not had time to open a book or journal since he had graduated. To the Professor this man's failure in his profession could not possibly have been greater if he had disgraced it.

If we see to it that every student learns to read intelligently and with an end in view, many of our teaching problems will disappear. Among them will be the problem of the use of the large amount of free time in our curricula, a difficulty needlessly troublesome to many schools.

If it is important that a student have the right sort of intellectual background and training, it is far more essential that he have qualities of heart and spirit above the average man. There is hardly a field of clinical medicine which will not demand fine traits of character. The man whom a school turns out without them will be a stigma to the community.

Perhaps there is little profit in a detailed discussion of good traits and indicators of character in a symposium. Yet our subject necessitates at least a mention of them. One of the most important qualities, one at a premium from the first contact of the student with patients to the end of life, is personality. I am sure that most of you have felt as I have, every year, when coming in close contact with some man who possesses this to a marked degree: "If only we could have more students with personality, how many more would succeed!" A man without it may achieve success in medical school and in practice, but with it he will go much further because of his ability to attract men and hold patients. The right sort of personality will assert itself in spite of routine methods of teaching. It will attract and lead at least a majority of those with whom it comes in contact. Unfortunately it is something which education alone cannot give, but, in fact, may even seriously hamper. It evolves from a man's parents and is enriched by his home-life and his social contacts.

Enthusiasm is not just another of the attributes of a desirable medical student. I have come to regard it as among the most important. One of the most attractive things about college students today and one of the most vital is their keen interests, their enthusiasms. May they never wane nor grow cold! It is to be regretted that ordinarily so much of this zest and zeal for things is not kept in medicine. Many of its results, its wonderful advances, are worthy of just as great enthusiasm and as absorbing an interest.

A story is told of a clinical professor of the old days in one of our Eastern cities whose students idolized him. He held them so spellbound by his work that they followed him on every case day and night. He was never seen without them. Finally one of his patients jokingly remarked, "I notice you have your 'hounds' with you today!" and from that time on Professor M.'s "hounds" were a popular byword. We need more students of this type in our schools today, men who are interested enough in their work to be on hand at any cost when things are happening; men who follow medicine as an advancing, disease-conquering art and science; men who are interested in patients as human beings, in experience as a means to knowledge, and in study as an interpreter of experience.

The last attribute which I take occasion to discuss is moral stamina, integrity—or call it what you will: a sense of honor which will resist dishonesty in the classroom and out, and which in the last analysis of things will compel a student to be honest with himself in his judgments and dealings. There is absolutely no excuse under any circumstances for a medical school wittingly to graduate a dishonest or immoral man. The hazard to the school's reputation would be too great. A practitioner is constantly entrusted with the welfare of his patients in the most intimate and personal manner. A man who turns traitor to such a trust or who employs dishonest methods in practice, may soil the good name of a medical school in a community for years to come.

By this time I am sure that I have laid myself open to the criticism that I have described too wonderful a medical student to find in a lifetime.

The man, some of whose qualities I have portrayed, is not a superman nor an ideal one. He is found quite frequently in our upper medical classes today. The problem which we should be very much more interested in, rather than in what constitutes his desirability, is how to obtain more men like him.

I shall try to answer this by a few suggestions, which on account of the necessity for brevity may seem like a page from a notebook.

First, in choosing men for medical school we must realize that grades help in determining a man's industry, but are not necessarily the final index of his success in medical school or in after life. While it is true that men from the lowest grade group very rarely succeed,[5] the converse does not necessarily follow. I am convinced that the measure of success achieved at any period of life is dependent largely upon a man's constitutional makeup and the single-mindedness of purpose which he shows during that period. We must not overlook the fact that a seemingly very bright man may be merely a bookworm, a memorizer, without any common sense or ability to apply his knowledge; or that another may have a serious personality disturbance, distracting habits, or too many financial burdens to become a desirable medical student.

Again, definite improvement may be made in the selection of men with the right qualities by the appointment of more clinical teachers of the right sort to admission committees. To know, first hand, the qualifications for success in medicine will be a valuable asset in weighing evidence of the personal fitness of candidates.

The candidate for admission may be much more effectively passed upon if, as at Johns Hopkins, a personal interview is required wherever practicable. If this is not possible, good confidential letters from both high school and premedical instructors or interviews between the latter and the committee are safe substitutes, provided the particular instructor is known and may be depended upon to give an unbiased and accurate opinion.

Lastly, it will be advantageous to have a comprehensive examination at the end of the second year to determine a man's fitness to pass into the clinical years. This should be held under the supervision of the clinical department. Its chief purpose should be to determine a man's fitness to go on by testing his ability to coordinate and apply his knowledge. If he were found to be more suited to research or teaching in one of the medical sciences he could tactfully be directed to pursue his work further toward a Ph.D. degree.

Such an examination is not a new idea, but is now in force in several schools. Yale has recently arranged her medical curriculum so that a man may obtain his Ph.D. degree in one year after he has completed the first two years of medicine.

Such changes as these will of necessity be a matter for each school to work out individually. In time, however, they will so alter the method and the standards of judging medical students that the more individual and personal qualities, which largely determine a man's fitness, will be elevated to the position which they should rightfully occupy.

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DISCUSSION (*Abstract*)

Symposium on What Constitutes a Desirable Medical Student. Papers of Dr. MacNider, Dr. Lynch, and Dr. Douglas.

(Manuscript of the paper, "Viewpoint of a Pre-Clinical Teacher," by Dr. Wm. deB. MacNider has not been received for publication.)

Dr. C. C. Bass, New Orleans, La.—As has been very aptly said, although previous scholarship may indicate that the student will be successful in getting by his examinations in the medical school, it is no certain indication that he will make a good physiican or a very useful member of the medical profession. The personality, ideals and aims of the individual often mean more than scholarship.

The practice of medicine is, to a large extent, an altruistic occupation in life, but, unfortunately, many go into it for other purposes. For this reason we have to select our students from among applicants many of whom lack the most desirable qualifications, which is the desire to prepare themselves for medical service for the benefit of others and not primarily for their own benefit. Incorrect impressions as to the financial returns that may come and a desire for the sensational and the spectacular are often the influences that lead students to take up medicine.

Another thing that keeps us from having an opportunity of selecting some of the most desirable students is the cost of medical education. Many of those who would be successful students and most successful

physicians cannot possibly afford the cost of a medical education, while many of those who can afford it are unpromising.

Grades made in the pre-medical courses are of less value than some other qualifications in determining the success or failure of a student. We are inclined, however, to give most weight to previous grades in selecting students because of the ease with which the grades can be assembled and the exact way in which they are expressed in contrast with the difficulty of ascertaining and evaluating other qualifications.

Dr. Lewellys F. Barker, Baltimore, Md.—Of course, I would go as far as anyone in recommending the desirability of finding men with strong altruistic impulses. At the same time I think we must face the facts of human nature. We have, every one of us, egotistic impulses, as well as altruistic impulses. We should not neglect the satisfaction of egoistic impulses and lay the whole emphasis upon the altruistic impulses. Young men will respond to an appeal to their altruistic impulses when the appeal is properly made, but we must recognize their egoistic impulses, too. Realization of the self in service to society is the ideal, whether in medicine, in business, or in anything else. A man should be able to satisfy adequately all his natural impulses. Each of us has a large bundle of instinctive desires of various kinds. The desire for health is an important one; and that for economic security is natural and laudable. Every man who makes his living in a decent way is, I think, performing a service to society. It is quite ethical to make a living for oneself and to supply the means for the comfort of one's family. Then there is the social impulse to be considered. A man is badly balanced if he has not the normal social impulse, including the tendency to marry, and the tendency to associate with his fellow men. Again the impulse to gain knowledge is a normal one. If a young man has not a well-developed instinct of curiosity he will not make a good medical student or a good student of any kind. Moreover, a strong esthetic instinct is useful. On this depends the desire for the creation of beauty and for the appreciation of beauty. I think if there were love of beauty in our every-day work we should all be better off. Commercialization, in its bad sense, is ugly, and we hate it. Finally, there is the natural desire to do right; it is a part of the ethical instinct. A person is luckily born who has a well balanced group of impulses: the impulse to love, the impulse to social activities, the impulse to acquisition of knowledge, the esthetic impulses, and the impulse to do right; if we could find students with all those impulses, proportionately active, then we should have ideal medical students.

Dr. Robert Wilson, Charleston, S. C.—I recall reading, a number of years ago, the very interesting essay by one of the Victorian masters of experimental science, John Tyndall, on the "Scientific Use of the Imagination." We do not often think of the imagination as an important factor in scientific achievement, and yet a moment's consideration will show that this mental faculty is an essential prerequisite to productive work. As was just pointed out by Dr. Barker, we concentrate our attention too much upon trying to cultivate the reasoning faculty in our students. The emotional side of the mind, especially the faculty of imagination, is likewise important; indeed is necessary for the highest grade of accomplishment. Culture is the improvement and the refinement of the mind, not for mere ornament, but to render it a better working instrument. Whatever accomplishes this end makes for culture. Even a dry scientific course, as was said this morning, in the hands of a master teacher may be made a means of culture. Tyndall found emotional stimulation in Bain's "Logic," and Goethe's "Farbenlehre," which he termed "two volumes of poetry."

That kind of education is most desirable which aims to develop these faculties and to stimulate in the student enthusiasm and intellectual curiosity and as a corollary the student whose mind is so developed is the most desirable student, other things being equal.

Dr. I. H. Manning, Chapel Hill, N. C.—The student comes to the medical school primarily to learn medicine, and it is the obligation of the school and the teacher to teach him all that is possible for him to learn about the subject.

First, we should remember that the first year medical student knows nothing more than a layman, and the second year student only a little more. We are told to train them to think. What are they to think about? They should be taught the fundamental facts and theories, so that they may have some substantial background for thinking, and it seems to me that this is the first obligation of the school.

The student should be given the methods of medical investigation. Early in my career as a teacher I was asked by an excellent country doctor to make a blood count for him on a specimen of blood that he would send me. It was about the time the Widal test from a drop of clotted blood was being introduced. In another instance I was asked to examine a lochial guard which had been worn some time previously, for the gonococcus. Obviously, these men had never had the opportunity of doing a blood count or making a bacteriological examination. They are not to be criticized, but if our graduates should make a comparable blunder the school or teacher should be held responsible. I know that in trying to teach the student all that he should know we may go to an extreme. For example, there are very few graduates who would undertake a basal metabolism test, but the medical student should be given the opportunity to go through with the procedure. He will know how it is done, the possible chances of error, and the limitations of the test.

Again, we are emphasizing today more than ever the scientific aspects of medicine. We expect our graduates to keep up with progress in the science of medicine, and we are therefore under the obligation to teach the medical student the fundamental principles on which the science is based. When I was a student of chemistry, physical chemistry was not taught and very little known. Mathematics was not considered a prerequisite to the study of chemistry. Now this whole field of physical chemistry, which has thrown much light on chemical and physiological problems, is practically closed to me. I cannot read the literature, and it is a great loss. Serum therapy has made great progress and promises more. To give the student a background for the rational practice and to enable him to follow intelligently the developments in this field, he should be taught the fundamental principles of immunology and serology. So, if our graduates are to grow in the science they must be given the background upon which to grow.

With these three aspects in view the teacher is constantly afraid that he may fail in his obligation, and is inclined to teach more, rather than less.

Dr. Jack C. Norris, Decatur, Ga.—The ultimate qualifications and morals of the student who is to become a physician largely depend upon the professors who teach him. I realize this because when I was in medical school my whole outlook on life was changed by the influence of my distinguished professors.

How long should the student stay in medical school? The student today does not desire that the time be changed. The four years of academic work, I think, are desirable, and are barely enough.

The teacher should try to train himself to see the student's views and reactions and to understand his attitude.

A Member.—It has been my fortune to be associated rather closely with one of the largest theological schools in the Country. The tendency is for less desirable men to enter the theological school than twenty-five years ago. The financial returns are inadequate in view of our advancing needs and requirements for the development of the individual and the family. In other words, the returns are not commensurate with what is put in. The medical profession in the past has decried all question of finances. Commercialism is a great evil which we should decry. But are we not going to the other extreme in teaching our students to forget the financial side? Perhaps we are discouraging young men who might be very desirable students and making them fear that if they do enter medical school and put in six or eight or ten years they will not be compensated as they should be.

Dr. Wilburt C. Davison, Durham, N. C.—The experience at the Johns Hopkins has demonstrated that the selection of medical students can be improved by paying less attention to grades and credits and more to the character and intelligence of the candidate. Prior to 1924, when grades and credits were the criteria, about 15 per cent of the students failed; since the selections have been based upon intelligence and character less than 2 per cent have failed. The opinion of the applicant formed by the selection committee or its regional representative as a result of a personal interview has been very valuable. This discussion on the value of four years' work in college has contained the common mistake of confusing education and culture. They are not synonymous.

The majority of those who have culture have gained it at home or from associations and environment early in life.

Dr. Lynch (closing).—I cannot quite get Dr. Davison's distinction between education and culture. I doubt that even a lack of table manners would indicate lack of culture. I am quite sure that Dr. Davison is a cultured man, in spite of the fact that he says he is not. The fact that he has no ear for music or eye for a painting does not indicate lack of culture. Culture is something beyond that. Broad education is likely to bring out culture, particularly, and that is why I am interested in broad education. I do not like to specify—I could not, and it seems to me that nobody can specify—what is a broad education. It is different in different schools. As someone said, you can get a broad education out of chemistry in one place and out of biology in another.

I am afraid there has been some misunderstanding of my indictment of the commercial tendencies in medicine. I would not for a moment think of going back to the old system, where the physician had no accounts and conducted his affairs in a wholly unbusiness-like way. Nothing is further from my mind than that. But I believe there is more commercialism in education, and I think the fault is in the medical school itself. We pay too little attention to keeping that out of the medical school. I would not go quite so far as Dr. Bass in saying that the altruistic spirit is the whole thing in medicine. A man has to be on a decent social plane and has to have egoistic impulses, as Dr. Barker says, and has to be assured that he can live as other people do.

Dr. MacNider (closing).—The average man who has a bachelor's degree, in the long run, or in the short run, in his second year or maybe in his first year, is a better student in general than the fellow who has had a short period of premedical training.

Dr. Davison.—Do you not think that perhaps that is because he was a better man in the first place? His college instructors told him four years would be a better preparation and being keen and ambitious, he followed the advice.

Dr. Manning.—This is a sore point with me. I have been admitting students for years. For a long time I gave the A.B. men the right of way, then the three year men, and finally the two-year men. Some of the most impossible students have had the A.B. degree. I think, of course, the good student will be the better for having had the four years of college, but when an applicant says he has been in college for four years and he has an A.B. degree, I have learned to withhold judgment until I have his record. If his record shows just passing grades and probably a number of failures I refuse him. This type of college man has gained very little, if anything, by his four years in college. He has probably learned best of all how to loaf, and is entirely satisfied to continue with the same grade of work. He has found college life easy and agreeable. I would much prefer having a student with two years of college work, if he has used his opportunities to advantage, than one who has consistently loafed through four years of college.

Dr. Barker.—This is rather a sore point with me, too. I did not, myself, have any college training, and I think perhaps those of us who did not have college training may over-estimate the value of it. I have always regretted the lack of it and wished I could have had at least two, or, better, four years of college. But this whole discussion is overemphasizing what education does. It is the constitutional make-up of the men who go into medicine that is most important. Training will bring out what is in them and help to develop culture, but without adequate constitutional potentialities education is relatively hopeless.

Dr. Lee Rice, San Antonio, Texas.—I am inclined to excuse the man who admits the medical student. He sees him for a few minutes or a few hours and gets no conception of the real man. But the clinical man, who sees him for two years, does know the man. If we demand just common honesty and integrity, with a fairly good mind, it will solve the problem. We have men coming to our cities, graduates of medical schools, who are lacking in these essentials. I have in mind three men who were expelled from my fraternity but were permitted to go on and graduate from medical school. All three of these men have gotten into trouble. I cannot help but feel that they should not have been graduated. We have seen men in our hospitals who had not been there a week before we knew they lacked

common honesty; in other words, were crooks. I begged some of my old chiefs not to graduate certain men, but was told: "Well, they have gone so far that we can hardly stop them." If we can stop a man who has not the qualities essential in a physician, common honesty and integrity and fairly good mind before he graduates from medical school, we shall develop better doctors.

Dr. Stuart Graves, University, Ala.—If we were free to select students according to deliberate good judgment, there would be fewer mistakes made. Everybody who has worked in a dean's office or sat on a committee of admissions, I might say almost in the best of schools, knows that such an executive officer or such a committee is not always absolutely free to exercise his best judgment. That is why I emphasized in my paper this morning that one thing we need to do is to make the people aware of our responsibility to them in selecting students. To be sure, the medical student has to expend a considerable amount of money, but there is not very much excuse for talking about the expense of education when the number of motor cars bought in the United States and the number of movies are what they are now. Any ambitious American boy or girl who has the character and the purpose and the health and the mentality can get any kind of education in this democratic land that he or she wants to get, and lack of money is not an objection.

Of course, we should not select men just because they have college degrees. I think we might go a little further and say we should not always select teachers because they have one or two advanced degrees. Character and integrity and purpose in life, plus that indefinable thing which we call personality, that thing that attracts men to other men, that thing that makes a physician popular and successful in practice, are the things that enter into the general promise of a successful medical student. It is a hard thing to define or to judge, and one man's judgment on that particular point may be different from another man's judgment. It may be judged fairly well by the dean in his office talking to a student. On the whole, I think that is a good method. It may be judged fairly well by a field representative whom you know and in whose judgment you have confidence. It can be judged to a certain extent by a cross section of references from honest, experienced teachers in college who will give you their estimate of a man's character and the fixity of his purpose, and his ambition and his native intelligence. What do all those things figure up to? Just the same thing that an intelligent business man relies on when he selects his family physician. If you ask him why he selects his family physician he will have a hard time telling you. It is that his whole impression of the physician gives him confidence in the ability of the physician to care for his wife and family and himself.

I have just been making a study of the medical schools of the United States. So far as I know, there is just one strictly graduate school of medicine in the United States, and that is in Chicago. The other schools which require degrees, such as Hopkins and Northwestern, sometimes take men without degrees. Many of the best schools require three college years. But the majority of the schools have at the present time the minimum set by the American Association of Medical Colleges, namely, sixty hours. Now, it is an interesting fact that, although the minimum requirement is only two years, the great bulk of the men offering themselves have three or four years' preparation. Why? Because the student knows that he will be a better physician if he has a better premedical education. I do not see how, in the next generation, we shall avoid having better educated physicians. It is just an instinctive thing on the part of the students now, and I do not think we need worry about the number of hours we shall require, because the students are going to be in advance of the requirements of the average medical school.

Dr. Douglas (closing).—The failure of any student in his third or fourth year of medicine constitutes a great economic loss. It does not usually indicate inadequate preparation in the preclinical years, but rather an inadequacy of certain personal qualifications necessary to success in clinical work. The logical time to stress such qualifications is before the applicant has been admitted to medical school. It is my belief that more clinical men should be asked to serve on our entrance committees. Such a move will gradually modify standards of admission in the direction I have indicated, and will undoubtedly prevent many late failures.

CAVITIES IN PULMONARY TUBERCULOSIS*†

By ALFRED BLUMBERG, M.D.,
CONSTANTINE P. WALLER, M.D.,
and
ROBERT L. RUSSELL, M.D.,
Oteen, N. C.

The appearance of a cavity in the lung tissue during the course of pulmonary tuberculosis has always been viewed with misgiving and anxiety by the physician, as well as his patient, for its existence has always been associated with a less favorable prognosis. Recently Graff,[1] in Germany, emphasized this view and claimed that the presence of a pulmonary cavity is ultimately the patient's death warrant. Bacmeister and Piesbergen[2] expressed their disagreement with this contention of Graff. In their studies they used their sanatorium material and worked up their observations with great care. They reported that patients at times possess cavities which cannot be recognized by either clinical or roentgenologic means, no matter how careful and expert the examiner may be. In this study cases of exudative tuberculosis were excluded, when such cases were accompanied by high fever and offered a poor prognosis from the onset, for in such patients the existence of a cavity was merely an accompanying manifestation of a continuously

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†From U. S. Veterans' Hospital, Oteen, N. C. Permission for the publication of this article was obtained from the Director of the U. S. Veterans' Bureau, Washington, D. C.

advancing tuberculous process. The other cases revealed the following.

One-half of this group were alive after six and one-half years' observation. Of those who died there were a number the cause of whose death was not directly attributable to tuberculosis. Of those still alive 50 per cent showed either a cure or an arrest to the extent of being able to look fully after their affairs, while 25 per cent were able to follow partly their vocations. The remaining 25 per cent showed no arrest, nor were they able to look after their affairs. They were incapacitated. Bacmeister and Piesbergen are not the only authors who express themselves optimistically.

Baer[3] states that cavities healed without leaving a trace of their existence, or with but a small scar remaining when relatively new cases in young persons were treated by induced pneumothorax. He presented roentgenograms to demonstrate this healing. Steinert[4] attempted to explain the conditions under which cavities heal. He examined the pulmonary cavities of twenty-seven cases. Fifteen of these had isolated cavities which drained poorly either during the patient's erect or recumbent position. He found repeated evidences of a tendency to heal above the level of the cavity contents in partly drained spaces, while below the level caseation and coagulation necrosis remained. He concluded, therefore, that improved drainage had hastened the healing process.

Alexander[5] also asserts that spontaneous healing may take place, and even larger cavities will diminish in size considerably within six to eight months, as is proven by roentgenograms. He has, however, failed to observe complete cure. Turban and Staub[6] also believe in the possibility of healing of cavities. They describe twelve cases, in three of which occurred contraction, while nine healed by fibrosis. In spite of this evidence they confirm the basic truth of Graff's dictum when they emphasize the fact that the presence of a cavity is a potential danger to its carrier.

Roubier,[7] in describing the existence of "closed cavities," insists that the danger is especially great when the cavities are surrounded by a dense scar. Smaller cavities of this kind may heal fully. By closed cavities he means cavities having no communication with the bronchial system either because the communication has never become established or because the communicating orifice has somehow become obliterated. Giegler,[8] in his investigation, excluded cases of acute and subacute caseo-pneumonic tuberculosis, in which the presence of a cavity represented merely an associated phenomenon which did not influence the course of the existing condition. He confined himself to cases in which the cavity was either of the progressively increasing type; partly clean; or apparently clean when observed microscopically. He gives a careful resume of his studies, saying that while he could raise no objection to the several cases quoted by Hart, the two cases mentioned by Lessing were the only ones which offered evidence of complete healing of their cavities. The other authors who claimed to have observed healing based their statements upon assumption rather than evidence.

In their studies of 651 cavity cases diagnosed by physical signs, Harry L. Barnes and Lena R. P. Barnes report the survival over ten years of thirty-two patients, while five have survived over fifteen years and two over twenty years. Disappearance of the roentgenologic signs of cavity, combined with the clearing of mottled areas in the surrounding lung tissue, is rare, in the experience of these authors, but they have records of nine such patients, all of whom are working and in good health.

In 1927 our Hospital exhibited a series of reproductions of roentgenograms during the annual meeting of the American Medical Association at Washington, D. C. These reproductions showed the gradual disappearance of cavities, some of which were of considerable size. Another series was presented before the members of the Buncombe County Medical Society, with the purpose of calling attention to the changes which occurred within cavities of patients. These changes interested us greatly, first because recurrence was observed of cavities which had partly or completely disappeared, and because the question arose, "How does a cavity heal when healing is apparently permanent, and roentgenograms show little or no evidence of the former lesion?"

We shall confine ourselves to a few statements which refer to the pathological findings of this condition, in roentgenograms and in specimens obtained post-mortem. The roentgenogram demonstrates the cavity only under certain conditions. Minute 3-4 mm. cavities are not recognized as such. Small, thin-walled cavities are often obscured by exudate, pleuritic process, or overlying tissues of denser structure. These cavities, however, will be discovered at autopsy in patients dying of pulmonary tuberculosis. These terminal findings, of course, cannot be wholly compared with the condition of a patient who, although he harbors a cavity, runs a clinically inactive course.

At our autopsies cavities of all kinds and all sizes are found. There are cases in which one or both lungs show cavitation, in all lobes or in some lobes only. We meet with cases in which all lobes of one lung have formed a complete union as a result of intimate pleural adhesions, while in the course of time the pulmonary tissue has disappeared and left but a shell behind, which is filled with purulent material. One specimen exhibited extensive excavation, yet the cavity wall was smooth and no purulent contents were present. Several cases showed cavitation in the lower lobe only, and cavities exhibiting partial obliteration by contraction or fibrosis were found repeatedly. Such cavities had smooth walls and no contents, yet on microscopic examination tubercles were found near by this clean cavity wall. Some cavities were surrounded by a dense cicatrix and others were so thin-walled that no distinct line of de-

marcation was noticeable. The inner surface of the cavities was either covered by caseous material, or tuberculous granulation tissue. Many cavities were of ragged, irregular appearance. At times there was marked hyperemia, and in some cases we found a blood clot. Specimens measuring but 3-4 mm. in diameter were encountered, which closely resembled the ones described by Roubier. Larger cavities of this "closed" type were also seen, and these represented grossly a tuberculous abscess rather than a cavity. A completely healed cavity was never found by us at post-mortem.

On microscopic examination evidence of healing was found in several instances. Two specimens showed a tendency towards epithelialization. This was limited in extent. In one specimen we found two small cavities close to a larger one. One of the cavities was free from tuberculous granulation tissue, which had been replaced by a smooth inner zone composed of connective tissue. At one point only was there a small deposit of round cells. The other small cavity also showed a connective tissue deposit similar to the one mentioned before, but the deposit was less complete and there was a larger amount of granulation tissue. The largest of the three cavities was about 1 cm. in size. It showed no evidence of healing; in fact, evidence of progression was present, with caseous deposit upon the inner surface, the caseous material crumbling into the cavity lumen. There were tubercles in close approximation, while the pulmonary alveoli were filled with cellular exudate.

Cavities surrounded by cicatrix may look grossly as if they were healing, but when they are examined with the microscope it will be found that many of them are either in close proximity to caseo-necrotic processes or contain in their walls small tubercles and many dilated and engorged blood vessels, the cavity itself being lined with soft, crumbling, tuberculous granulation tissue. Dilated and engorged capillaries are within the cicatrix and at times reach the inner zone of the cavity wall. Such capillaries, when erosion occurs, will give rise either to streaking or to frank hemorrhage. Larger blood vessels which sometimes traverse a cavity are as a rule thick-walled, the lumen being narrow or even obliterated.

We have found cavities which were so close to the thickened pleura that microscopic examination exhibited no pulmonary tissue between the cavity lumen and thickened pleura. Such cavities may give rise to spontaneous pneumothorax, as microscopic examination shows a focal aggregation of round cells and extension of the tuberculous process into the pleura. This is not true in all cases, and the pleura often offers good protection against such an accident as spontaneous pneumothorax. Cavities lying very close to bronchi were also found, and cavities of the progressive type which encroached upon the bronchial wall.

When the lung is involved with cavities of the progressing type the odds are very much against the patient, for these are the findings in cases where the patients have died of pulmonary tuberculosis. On the other hand, even in terminal cases there is evidence that healing has been attempted. This attempt can be demonstrated with the roentgenogram, as will be seen later. One may, therefore, hope that conditions may exist during which spontaneous healing is accomplished. Giegler states that

> "Healing is accomplished only when, after replacement of tuberculous granulation tissue by the usual granulation tissue the latter is replaced by connective tissue and finally epithelialization of the inner surface of the cavity has completely established itself."

He admits that the soil upon which the cavity is engrafted has a great deal to do with the progress of the condition. On the other hand, he shares the opinion of Graff.

We have at least thirty-seven cases which, from a roentgenologic point of view, demonstrate a good tendency towards healing of cavities. All these measure 3 cm. or more; smaller ones were not considered for study. We have some cases in which multiple cavities have contracted, and we have cases in which cavities completely disappeared, this being accompanied by general clearing of the other pathologic processes within the affected lungs.

The following cases with roentgenograms will demonstrate the various healing tendencies.

Case 1.—This patient entered the hospital in 1925, but remained here for a short period only. He returned to Oteen in September, with a diagnosis of pulmonary tuberculosis involving all lobes, activity "C." This case is demonstrated with the purpose of showing that cavities may contract even in far advanced cases upon bed rest.

In August, 1925, roentgenograms of the right lung showed definite increased density along the terminal branches and vertebral trunks, and light, flocculent shadows in the first interspace. In the left lung the hilum was pulled up and thickened, and there was thickening of the lymph nodes along the trachea of this side, and apparently a large cavity extending from the second rib to above the first rib. There was great density in the apex above the cavity. Below this the lung was fairly clear. In September, 1928, the patient re-entered the Hospital, having a large multilocular cavity ex-

tending from the apex to the lower border of the second rib in the right lung. There was also extensive fibro-caseous involvement down to the fourth rib, with diffuse involvement to the diaphragm. The left lung showed a multilocular cavity lying against the lateral chest, extending from the apex to the upper border of the second rib. Diffuse involvement, which was largely fibrous, but with some caseation involving the remainder of the upper lobe and the upper third of the lower lobe, was also present. A roentgenogram made on September 29 showed, however, contraction of the cavity in the left lung, as compared with a roentgenogram made on September 15.

Case 2.—This patient remained in the Hospital for a short period in February, 1922. He left without leave. He entered the State Sanatorium in 1923, where he remained a year as a twenty-four-hour bed patient. Then he returned home and continued twenty-four-hour treatment for eighteen months, after which he remained in bed for four hours each day, having gradually shortened his former period of bed rest. He returned to Oteen in April, 1928, where he remained for observation until May 9, 1928, when he left without leave. A cavity which had existed for six years in the second interspace of the left lung had disappeared completely.

Case 3.—This case is introduced with the intention of showing that a cavity may improve but will reopen or enlarge again when the patient fails to take his treatment seriously. The patient entered a Navy hospital in 1925. Somewhat later he was admitted to Oteen with a diagnosis of pulmonary tuberculosis, moderately advanced, activity "A." Several months later he was discharged for home treatment upon his request. He returned to this hospital for re-examination a month ago.

In July, 1925, the roentgenogram showed diffuse caseation in the right upper and upper third of lower right lobe. There was gradual clearing to January, 1926, at which time the cavity was 1 cm. in size. In July, 1927, the cavity enlarged to 4 cm. in diameter and again was found contracted in November, 1927, when it was surrounded by a markedly thickened wall.

Case 4.—The patient had influenza in 1918. In 1922 the existence of pulmonary tuberculosis was detected, and he entered the Maryland State Sanatorium. He came to Oteen in 1924, and remained there until 1925, when he left with a "maximum benefit" status. He was re-admitted in 1927, at which time he had tuberculosis of the larynx. On October 30, 1924, there was a cavity in the right upper lobe, which in the roentgenogram was 5 cm. in diameter; and in addition there were diffuse fibro-nodular lesions involving practically the entire lung on both sides. In May the same condition existed, except for the cavity, which was then only 1 cm. in diameter. In August, 1927, the cavity increased again to 5 cm. and there was diffuse granulation throughout the entire lung. In November, 1927, the cavity measured but 2 cm., while in May, 1928, extensive multilocular cavitation had taken place in the right upper lobe, with caseous bronchopneumonia in both lungs. This case is shown chiefly to illustrate the danger of interrupting treatment.

Case 5.—This patient became sick in 1924, but continued to work until August, 1925, when he was hospitalized at Oteen, with a diagnosis of far advanced, active chronic pulmonary tuberculosis. He remained in this Hospital until his demise. During this time he was not a model patient. Although supposedly a twenty-four-hour bed case, he failed to live up to this. Six weeks before his death he was operated upon for hemorrhoids and fistula. From then on he failed rapidly and finally died. The interesting feature in this series of films is the complete disappearance of a huge cavity and the contraction of small multiple cavities. In August, 1925, this patient had an enormous cavity measuring 9 by 6 cm., which occupied the upper left lobe from the apex to the third rib. It was surrounded by extensive caseation with diffuse caseation down to the fifth rib. In the right upper lobe massive caseation was present from the apex to the third rib and diffuse caseation down to the fifth rib. Small multiple cavities were present in the apex and second interspace. On January 4, 1926, marked diminution in size of the cavity in the left upper lobe occurred. Gradually until September, 1926, the cavities on both sides diminished. In August, 1927, the patient returned to the Hospital. He showed at this time evidence of aspiration into the right lower lobe without apparent increase in the size of the cavity in the right upper, while the cavity in the left upper lobe had definitely decreased in extent. In October, 1927, further decrease in the size of this cavity took place, in addition to some general clearing throughout. As we can see, the cavity in the right lung has entirely disappeared, while the one in the left lung is contracted into the shape of an ampulla, its length being 2 cm. and its widest diameter 1 cm. in extent.

Case 6.—The patient dates his illness back to 1922. He was hospitalized in 1927 at Oteen, remaining there for a short period only, having been treated in an outside institution for a while. He returned to Oteen in January, 1928, and was discharged in October, 1928, as an arrested case. A roentgenogram in August, 1927, showed a cavity 3 cm. in diameter within the left upper lobe. There was also diffuse fibro-caseous involvement of the entire lung. In January, 1928, the cavity had entirely disappeared and there had been general clearing through the left lung. This clearing continued to August, 1928, when the only signs of disease were small fibrous nodules widely scattered throughout. These nodules, 3 mm. in size, were found in place of the former cavity.

Case 7.—The patient showed his first evidence of illness in 1925. He was under the care of a private physician until 1927, when he entered this Hospital, from which he was discharged in May, 1928, with the report, "No need of further hospitalization." This patient had a thin-walled cavity 5 cm. in diameter in the right upper lobe and a multilocular cavity 8 x 4 cm. in size in the left upper lobe. These were found in June, 1927. In addition, the lungs showed diffuse nodules throughout. From the date mentioned to September, 1928, the cavities showed gradual contraction and the nodules showed similar changes, with fibrosis. Between May, 1928, and July, 1928, the cavity which at the earlier date measured only 1 cm. increased to 2 cm. However, two months later there was no evidence of its presence.

Case 8.—In 1920 this patient had a hemorrhage, for which he took a rest cure lasting six weeks. In 1922 his condition was diagnosed as pulmonary tuberculosis. He had worked up to that time. He was hospitalized in another government institution after his diagnosis was confirmed at the Cleveland Regional Office. In January, 1927, he came to Oteen and remained here until September, when he was discharged as being in "No need of further hospitalization." In October, 1923, this patient had a cavity 5 cm. in diameter in the

right upper lobe. Diffuse fibro-caseation was also present throughout the right lung. No improvement took place and the condition remained stationary to August, 1924. In February, 1925, the cavity had entirely disappeared and there had been general clearing throughout. Contraction had taken place in the nodules gradually from that date up to September, 1928. There was also shown an extensive deposit of calcium between March, 1927, and September, 1928, when no trace of the former cavity was recognized.

Case 9.—In August, 1926, a private physician found it necessary to send this patient to a government institution. At that time the diagnosis was "pulmonary tuberculosis in the right upper lobe, with cavitation." He remained at this Hospital until his discharge, when he left as an "arrested case." In August, 1926, there was shown a cavity 3 cm. in diameter within the right lung at the first interspace, in addition to fibro-caseous nodules which surrounded the cavity and infiltrated the apex. In December, 1926, the cavity had entirely disappeared and considerable clearing had taken place in the apex and third interspace. Further clearing took place from that date to August, 1927, when the lesion appeared to be entirely fibrous.

Case 10.—The patient entered the Hospital in 1927, although he was sick in March, 1925. The diagnosis upon admission was "pulmonary tuberculosis, moderately advanced 'B.'" He remained at this Hospital until October, 1927, having completed his hospitalization. In June, 1926, roentgenogram showed a cavity 3 cm. in diameter, behind the first rib in the left lung. There was also diffuse fibro-caseation which involved the left upper lobe. The same condition was present until January, 1927, when the cavity disappeared entirely and extensive absorption of exudate in the left upper lobe was observed. Further absorption and contraction took place until June, 1928, when there was very little evidence that this patient had ever had pulmonary tuberculosis.

Case 11.—This case is presented to show that cavities may take care of themselves, even though the patient fails to live up to expectations as far as treatment is concerned. The patient was admitted in May, 1926, and discharged "against advice" in October, 1926. He returned to this Hospital in March, 1926, but left again "against advice" during the same month, his cavity having been closed in the meantime, although he developed tuberculosis of the left hip joint. In May, 1926, there was in the left upper lobe an oblong cavity measuring 6 x 2.5 cm., in addition to fibro-caseous involvement in the apex and first interspace and diffuse involvement down to the third interspace of that lung. The right lung showed diffuse fibro-caseous involvement in the second and third interspace. In November, 1926, the cavity in the left upper lobe decreased in size until it measured not more than 3 x 0.5 cm. There also had been marked absorption in the other lesions of both lungs. From this date to January, 1928, gradual absorption and contraction of the cavity took place until there was no further evidence of cavity formation and until the remaining disease appeared to be represented entirely by diffuse fibrosis in the left upper and right second and third interspace.

The cases reported were taken at random, not selected. In reviewing the changes which occur one is impressed with the fact that disappearance of cavities is a possibility. It is our custom to compare all roentgenologic findings upon a case coming to post-mortem with the specimens obtained. Cavities seen in the roentgenogram are always found in the lungs of the subject upon post-mortem. We, therefore, feel certain that the cavities which disappeared were in reality cavities when demonstrated first upon the roentgenogram.

Microscopic studies have taught us to be conservative; on the other hand, clinical and roentgenologic observations have proved to us that in a certain number of cases there is a lasting disappearance of the cavities. We wish to add, further, that in our opinion no patient should be discharged from a hospital as cured or arrested shortly after the disappearance of the cavity. Only when all other tuberculous lesions have undergone clearing also should he be allowed to leave the hospital, and then only after a period of graduated exercise has demonstrated that he is clinically an arrested case.

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DISCUSSION (*Abstract*)

Dr. Karl Schaffle, Asheville, N. C.—As students we all had the idea that in the tuberculous lung, when there was once a cavity there was always a cavity; further, that such cavities became gradually larger, multiple, and coalescent, from the extensive tissue destruction of the disease process. Doubtless this idea was responsible for the fact that in the anatomical-pathological classification of Turban, all cases of pulmonary tuberculosis with cavitation were placed in the category of the "far advanced," with a correspondingly unfavorable prognosis. While this classification was adopted with little modification by tuberculosis associations of various countries, it has always been difficult to interpret, especially in those cases in which the clinical condition does not correspond with the pathological findings. You may be familiar with the attempts to classify tuberculosis upon a clinical basis. Frequently the physician is embarrassed by the necessity of filling out an application for a disability benefit, or admission to a sanatorium, based upon this cast-iron classification, when he feels that the patient's condition and prognosis are much better than it would indicate.

In some quarters a pessimistic tone still prevails as to the outcome in cavity cases. In the work of Bacmeister and Piesbergen cases of exudative tuberculosis are excluded. While much has been said of late years by Winternitz and others in this Country as to the differentiation of this type from the proliferative, productive or fibrotic type, and the relative prognostic significance of each, it is possible for the exudative case to become favorable or for the productive case to become unfavorable, depending, as indicated by Krause, on the factor of allergy. The cases shown here are mixed, but from the radiograms it is evident that the fibrotic process predominates.

While we regret that Dr. Blumberg has not as yet found a completely healed cavity at post-mortem, he has indicated that such a thing is possible.

When Dr. Dunn first showed me x-rays in which cavities became rapidly smaller and finally disappeared, with apparently complete clearing in the entire lung of all evidences of disease, I could hardly believe that the plates were of the same patients, or if they were that the patients really had had tuberculosis. Later, when I had been with him longer I observed the associated clinical improvement, with the accompanying changes in physical signs. Naturally, it has been gratifying to have our findings corroborated at the neighboring Government hospital.

It was Dr. Dunn's contention that healing takes place chiefly during the period of bed rest, and that rest should be interrupted for no purpose whatever, but should be continued until the desired result had been reached. This has been enforced for many years in all the private sanatoria in which his patients were under care. The same regime has been maintained at Oteen during the period in which the films you have seen were made. It was Dr. Dunn's custom to take x-ray pictures at intervals of three months, using a portable apparatus for bed and chair-rest patients. This procedure is being followed by the Dunn Memorial Clinic, under the directorship of Dr. C. D. W. Colby, who for seventeen years was Dr. Dunn's chief associate.

In several of our cases artificial pneumothorax was advised, or the patient was told that it might be necessary later. In a large series of cases cavities have been compressed by this method along with the remainder of the lung.

Dr. C. H. Cocke, Asheville, N. C.—Formerly three possible methods of evolution of tuberculous lesions were recognized and accepted, namely:

(1) Caseous degeneration, generally followed by softening and melting.

(2) Transformation into scar tissue or fibrosis.

(3) Calcification.

The first of these results as a rule in cavity formation. The other two lead to cicatrization and cure. Since the widespread use of the serial x-ray picture has afforded sufficient opportunity for observation, we now know what was not formerly admitted in any very general sense to be true, that the tuberculous products are capable of such regression that they may disappear sometimes in quite an amazing way and degree, by resolution. I shall not discuss why this erroneous idea of the failure of resolution of tuberculous lesions was held, but it was mainly due to the conception that the tubercle was a form of tumor of more or less immutable structure, and consequently forming elements quite different from ordinary inflammatory products.

While I myself have observed in an increasing number of instances the cure of tuberculous lesions by resolution, in recent years by reason of the fact that all of my cases are submitted to three monthly x-ray examinations, this conviction of resolution is firmly established in my opinion. Nor is this resolution especially limited to some exceptional clinical type, but it may occur in all cases of pulmonary tuberculosis where the cavities (and other lesions) are still of relatively recent formation, if their walls are still made up of new inflammatory tissue. Older lesions are different. Hence the age of the cavity is important for an estimate of the possibility of its healing, hard fibrous tissue walls of long duration being prone to hold the cavity open.

Amberson reported two years ago before the American Climatological and Clinical Association what happened to cavities in a series of 476 cases taken from the records of the Loomis Sanatorium.

341 CASES OF CAVITY LARGER THAN 2 CM.		135 CASES OF CAVITY LESS THAN 2 CM.	
47.2%	Increased	31.2%	Increased
17.3%	Unchanged	17.7%	Unchanged
38.8%	Contracted	34.1%	Contracted
4.7%	Obliterated	17.0%	Obliterated

This table, as you see, agrees fundamentally with the demonstration just given by Drs. Waller, Russell and Blumberg, and with my own observations.

Dr. Charles Phillips, Richmond, Va.—When Case 5, the negro, came to autopsy, in what condition was the cavity?

Dr. B. L. Brock, Louisville, Ky.—Have you found any evidence at autopsy to warrant a diagnosis of pleuro-annular rings? Many of us have been calling pleuro-annular rings cavities.

Dr. Blumberg (closing).—We have not shown selected cases. On the contrary, we took these at random from patients who received "bed treatment" only. You realize the difference in results, with patients for whom treatment was a more or less incidental affair, as compared with those whose bed treatment was strictly enforced.

We have the same difficulty in getting permission for autopsy as have other institutions. The body of the colored man about whom Dr. Phillips inquired was hurried away from the hospital before we had an opportunity to do a post-mortem examination. In passing, I wish to repeat that the average tuberculous patient is a poor surgical risk.

The question of annular shadows arises frequently. Our post-mortem findings agreed with the roentgenologist's diagnosis whenever he reported the presence of a cavity. I myself have not seen the annular shadow on the roentgenogram which on postmortem did not prove to be a cavity.

UPPER RESPIRATORY INFECTIONS*

By D. Lesesne Smith, M.D.,
Spartanburg, S. C.

Every man realizes the far-reaching significance of infections of the upper respiratory tract. Of all the acute diseases in children that we treat 90 per cent have their beginning in upper respiratory infections. Possibly 30 per cent of the fatal illnesses of children have their beginning in the same manner. The point I wish to emphasize is one brought up by Dr. Brennemann: "That any and every throat infection may initiate a series of pathological changes that may involve almost any part of the body, and that it is of value to adopt this viewpoint in our practice."

These infections occur at all seasons of the year, but assume an epidemic form at times, usually in the fall and spring.

They seem to be highly contagious; more so than any of the acute infectious diseases. Brennemann suggests that there is a decided individual and familial susceptibility. M. F. McCarthy says that if one member of the family has a chronic sinus disease all the rest of the family are likely to contract it; that is, that a chronic sinus is a fruitful source of infection for other contacts. One attack does not seem to confer any immunity, but on the other hand makes the child more susceptible.

The condition which I call upper respiratory infection has been called throat infection, grippe, influenza, laryngitis, and otitis, by different men. Its etiology has been much discussed in medical meetings. It seems to attack the healthy and strong, as often and as severely as those that are apparently not healthy. Some children are more susceptible than others to the disease. Riding in automobiles on dusty roads is a cause of respiratory infection in many children. Chilling as a predisposing factor has a well grounded and substantial hold on the public mind. Children between the ages of six months and three years seem to be more susceptible, although no age is free from it. Those over five do not seem to be so subject to reinfection as are those under that age. Careful and painstaking scientists have sought for a specific organism of the disease without reaching any conclusions. Some report one organism as causative; others report equally convincing evidence of the specificity of another. The streptococci, staphylococci, and pneumococci have all been assigned a prominent part, and recently colon bacilli have been isolated from many of these infections. It has been suggested that the non-pathogenic organisms and secondary invaders in a culture so overshadow the true primary organism that it is difficult or impossible to isolate it.

The onset of the condition is sudden. It begins usually with a mild cold, with or without fever. The child may suddenly awake during the night vomiting. Fever ranges from 101° to 105°. Symptoms vary in different epidemics. The child may have no fever, but pronounced vomiting, the so-called acidosis type. No one can predict in the beginning whether the attack will be mild or severe, or whether the infection will spread from the throat to the ears, accessory sinuses, or to other organs of the body. Brennemann divides the possibilities of the disease into three divisions: (1) the infection to all clinical appearances may remain localized in the throat; (2) it may spread by continuity and contiguity to adjacent tissues; (3) it may become systemic and lead through toxins in the blood stream to pathological changes in almost any part of the body. A typical case begins with redness of varying degree in the throat. Sometimes only a slight red line extends from one tonsil across the soft palate to the base of the other tonsil, giving a granular, red appearance, with a temperature usually of 103° to 104°. The fever subsides often in two or three days and the case seems well. Yet in twenty-four hours one may find the ears involved, with one or both ears red and bulging.

A compilation of statistics as to the frequency of ear and mastoid infection by Dr. Kenneth Day follows:

	Nutritional	General
Number of examinations	76	90
Positive ear findings	29	31
Per cent	38	34½
Mastoid operation	3	2
Improved with operation	1	2
Operation refused	2	

Average duration of discharge in fifty-nine cases, nine days.

In the vomiting cases, we do not usually find very much fever, but a decided throat infection. This vomiting continues from twenty-four to seventy-two hours. Some of the children become very much dehydrated and show all the signs of a typical case of acidosis. This type is frequently difficult to differentiate from intus-

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susception. Cervical adenitis is a frequent complication. The lymph nodes rarely suppurate. Many observers, among whom are Marriott and Mitchell, of this Association, have brought to our attention the frequency of nasal accessory sinus infection in this disease. A symptom which I have frequently observed and one which Brennemann calls our attention to is the abdominal pain which frequently accompanies this disease and may be mistaken for appendicitis. This is a common symptom and is frequently misinterpreted. The infection may spread downward in the bronchial region and cause a severe bronchitis or pneumonia. Pneumonia is not likely to follow unless there is an improperly drained ear. Nephritis, pyelitis, in fact, any kidney complication can be secondary to these infections. The skin rashes that occur are sometimes very puzzling, as they may be similar in appearance to any of the acute exanthematous diseases. Last, but not least, are the intestinal disturbances which have been described by Marriott and others, and which next to otitis media are the most common, as well as the most serious complications with which we have to deal.

The diagnosis usually is very simple. If the child has had a cold or even some other member of the family has had a cold, one's suspicions are aroused. If there is a sudden onset with fever from 101° to 102°, with or without vomiting, we feel reasonably sure that we are dealing with an upper respiratory infection. The chief diagnostic point is not the symptoms, but the physical findings. Frequently the throat involvement is so slight as not to attract the attention of the family. Children do not complain of sore throat so we have not this to guide us to our conclusion. Many cases can be diagnosed only by an examination of the ears. Most of the referred cases come with a diagnosis of stomach trouble. The throat should always be examined with a good light, preferably reflected light. Cultures of the throat are of no practical value and are often misleading. The character of the throat varies in the various epidemics. In some the tonsils are red and badly congested, in others they are but slightly involved.

All of these infections are contagious, but so far as I know no plan or method has been devised to lesson or control their spread. This is the one important phase of the disease that should demand our attention, for prevention seems to be our only hope. In some infant wards of hospitals the nurses are required to wear a mask. This has not done much to lessen the spread. In private homes the child suffering with the infection should be isolated, but as the disease seems to be more highly contagious in its incipiency this accomplishes little. Parents who have chronic sinuses should be informed of their danger as carriers and taught methods to prevent the spread of infection as far as practical. There is no way of judging the susceptibility of an individual, as we do in diphtheria, so the vaccine treatment has not been brought up to a standard of certainty. It seems to be a shotgun procedure and while we hear of remarkable success with it in some cases, in others it fails. The removal of tonsils does not lessen the susceptibility of the child, unless the tonsils are diseased. Children who have had their tonsils removed suffer as much as they did before the operation. If the ears become infected and the child has repeated attacks, adenoidectomy is of value. The adenoids are enclosed in a small space in the posterior nares and when they become congested free drainage is not possible. The resisting power of the child should be built up by keeping him in the fresh air and sunshine. Codliver oil is a logical drug.

Medical treatment offers little except to make the child more comfortable and relieve it of distress. Calomel, castor oil and other purgatives have no place in the treatment of these cases, since they deplete and lower the resistance. It is extremely important to give the child as thorough an examination as possible each time he is seen. Frequently a child has a red throat with negative ears and negative urine one day, yet in twenty-four hours the examination of the ears will reveal further spread of the disease or many cases will show a badly complicated or infected kidney. Many cases have all of the typical signs of pneumonia. Examination of the ears will reveal bulging. Upon paracentesis the symptoms all disappear. Diarrheas secondary to either a mastoid or throat infection do not get well under the classical treatment for diarrhea, but disappear when the proper measures are instituted for the relief of the primary cause.

Feeding is of great importance. Most of these children lose their appetites and the case becomes difficult to handle. No change is given in the order for food. Insist upon as much food

as the child will take. Fluids are important and should be administered in any form in which the child will take them. Because the child has fever is no reason why he should not have milk. In the vomiting type orange juice and crushed ice are often well borne. In some vomiting cases cereals are better tolerated than milk. Frequent feedings of small amounts of concentrated mixtures is reasonable and practical.

Upper respiratory infection is the most frequently occurring problem in medical practice at present. It is the task of the pediatrician to solve the mystery. The handling of hospital cases and private ones is entirely different.

Upper respiratory disease is a great imitator. From the similarity of its symptoms to those of many other diseases, it might be called "the monkey disease."

DISCUSSION (*Abstract*)

Dr. J. D. Love, Jacksonville, Fla.—I am glad that Dr. Smith referred to the familial incidence and the high infectivity of chronic sinus infections. I have had under observation for the past two years a family in which there are five children. All five in that period have had middle-ear disease. Four of them have had mastoid operations, and one a second mastoid operation.

Whatever the etiology of upper respiratory infection may be the common cold is usually the initial manifestation. Micro-organisms may account for the contagiousness of the common cold. The crowded conditions of the schools, the custom of overdressing the child and thus depriving it of the protective function which nature imparted to the skin, overheated houses, lack of fresh air and ventilation, exposure to cold and dust, drafty automobiles and homes may be blamed. But all these influences combined are less culpable than the omnipresent adenoids. On account of the anatomy of the posterior nares and nasopharynx the intimate connection with the ear and paranasal sinuses, the tendency of adenoid tissue to take on infection, and the mechanical damming by accumulated adenoid tissue of the nasal secretions in which micro-organisms multiply, adenoids should be assigned first place in the causation of upper and indeed, lower respiratory infections.

An array of conditions is mentioned by Morse as possible results of adenoids: rickets, deformities of face and nose, frequent otitis and deafness, and sinus infections, bronchitis, asthma, sleeplessness, malnutrition, anemia, fever, mental dullness, and others more or less distressing. We should correct the popular impression that adenoids ought not to be removed in infancy and early childhood, and devise plans through which every child, even those whose parents are unable to pay the fee, shall be afforded the undeniable benefits of adenoidectomy. We admit the frequent recurrence of adenoids following operation, but this simply demands re-operation.

SURGICAL IMPORTANCE OF ANEMIA*

By HAROLD H. FOX, M.D.,
Miami, Fla.

Anemia has been defined as a condition in which the blood is either deficient in quantity (oligemia) or in quality. The deficiency in quality may consist in the diminution of the amount of hemoglobin (oligo-chromenia) or in diminution in the number of red blood cells (oligocythemia).[1]

To discover this deficiency we must first be aware of what is a normal blood picture. We have been accustomed to consider a color index of 1.0 and a red blood cell count of five million for men, and four and one-half for women, per cubic millimeter, the normal average. Such counts are based upon the reports of four cases only, and this work was done in 1852-1854 by methods now obsolete. It is only in recent years by modern research methods that a few workers have challenged the work done over a half century ago. They have determined through blood examinations made on a series of 137 healthy male medical students between the ages of 19 and 30, that the average red cell count was 5,390,000 and the average hemoglobin content was 15.76 gms. per 100 c. c. of blood, and that the color index in 90 per cent of their cases ranged from 0.9 to 1.1.[2]

In a subsequent report of examinations made on one hundred healthy female nurses the average was 4,800,000. The average hemoglobin was 14.29 gm. to 100 c. c., and the color index in 90 per cent of the cases was from 0.9 to 1.10. From these reports it may be seen that the average red blood picture in both men and women is considerably higher in red blood cells and in hemoglobin than estimates based upon ancient findings by obsolete methods indicates. Correspondingly, an anemia reckoned by cell or hemoglobin estimates made by modern methods, but computed on the scale of former values, is greater in degree than that shown by the ordinary laboratory report. It is interesting to note that the amounts and percentages quoted were made on subjects living not over five hundred feet above sea level.

A question of practical value to us is: is the blood picture of the South, with its own climatic conditions, different from that of residents of latitudes farther to the North? On that point

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I am unable to find any reports sufficiently comprehensive to be acceptable. I am including here a brief table of red cell counts and hemoglobin estimates recently made in my office. The cell counts were made by modern approved methods and should be exact to within 3 per cent. The hemoglobin estimates were made by the Tallquist scale, which is admittedly inaccurate, possibly under certain conditions up to 10 per cent or more. However, it was used for clinical purposes, and not research work, as it is adapted to such work because of its ease and rapidity of performance, and since the other common method in use (Dare or Sahli) for rapid estimation has been shown to be equally at fault.

The cases reported were studied in my office, or in the hospital in connection with general surgical or gynecological conditions. Presumably patients coming for treatment could not be considered healthy. However, no counts made in frank hemorrhage cases or during menstruation were considered. In this group of fifty consecutive cases the youngest was seven and the oldest seventy-three years old:

From 5 to 15 years there were 3 cases.
From 15 to 30 years there were 11 cases.
From 30 to 40 years there were 15 cases.
From 45 to 60 years there were 13 cases.
From 60 to 75 years there were 8 cases.

There were 31 females and 19 males. The average age was 40.01 years. The average hemoglobin was 74.75 per cent, the average red cell count was 3,922,721, and the average color index was 0.94 plus. The average male red blood count was 4,276,000; the average female red blood count was 3,872,600; the difference 404,000.

This, I believe, represents the average blood picture of the general run of surgical and gynecological cases that we see.

Compared to our old standards, it shows rather a high degree of anemia, and compared to the modern statistics, a considerably higher degree. It is interesting to note that the color index determinations by the methods used closely approximate Osgood's most recent work. These figures, I believe, will give us a relative idea of the amount of anemia we meet in the ordinary surgical cases in the South, not due to frank hemorrhage.

Now, what are the common classifications of anemia and in what way does anemia affect the human system, to constitute a surgical risk?

In a broad classification we have the local anemias and the general anemias, the primary and the secondary anemias, and combinations of each classification. As examples of local anemia we have cerebral anemias and pressure anemias. Of general anemias we have the anemias due to massive hemorrhage, to surgical shock, and to numerous other causes. Pernicious anemia is frequently given as a type of primary anemia, and anemia from long continued hemorrhage or wasting disease as secondary anemia. All classes of anemia affect the human system to a greater or lesser degree, depending upon the severity of the anemia, and the attendant decrease in oxygen-carrying capacity of the blood, and by differences in concentration and cell volume, affect the chemical interrelation of the tissues to the blood and to each other.

The primary blood dyscrasias and the local anemias, with the exception of postural cerebral anemia, will be omitted from this paper, which will be limited to a discussion of general anemia produced by hemorrhage either acute or chronic.

Of the causes producing acute hemorrhagic anemia we have: (a) trauma to the blood vessel itself; (b) trauma to the blood vessel secondary to adjacent tissues.

The first may be occasioned by laceration of the blood vessel by foreign bodies, such as a bullet or a knife.

The second may follow such relatively common conditions as ruptured ectopic pregnancy, ruptured gastric ulcer, surgical operations on the nose and throat, severe crushing injuries, and the like.

As a concomitant of each and intensifying the anemia, there may be hemorrhage into the tissues associated with surgical shock and lowered blood pressure. Morganthaler[3] and others have shown that surgical shock produces marked general hemorrhage into the capillaries and by action of some unknown toxin through their single cell walls, into the surrounding tissues.

Assuming five liters to be the blood volume of the ordinary patient of 130 pounds, if this patient loses 25 per cent of his blood volume and his red cell count is 40 per cent of the normal, a not unusual condition, the oxygen-carrying capacity of his red cells is only 30 per cent of that of a normal individual, or the equivalent of 1.5 liters normal blood.

Considering the ordinary operative case as shown by my table to have an expected red cell count 80 per cent normal, if this patient loses only one liter of blood by hemorrhage, he has then an oxygen-carrying capacity of only 64 per cent of normal; it is equivalent to the loss of over one-third his normal blood volume.

These estimates will run higher if we will remember that red cell normals now average about six per cent increase over former standards, consequently an 80 per cent red cell count would be on the new basis, only 74 per cent. Thus his blood loss, if he suffered a hemorrhage of only one liter, would reduce his actual red cell capacity to 59 per cent of normal. In shock we may have by the action of some unknown toxins, porosity of the capillary walls and bleeding into the tissue spaces. This transudation is more largely of the blood plasma. Hence we have blood concentration, and direct loss of blood volume, leaving an insufficient amount of blood to maintain normal heart action, or furnish oxygen for normal human metabolism.[4]

Now, if we consider further the findings of Raine and Yates, of Columbia Hospital, on the effect of anesthesia and operations on the oxygen-carrying power of the blood, as presented at a recent meeting of the American Surgical Association, we find that one-half hour's anesthesia of a healthy adult with nitrous oxid-oxygen, or ethylene oxygen anesthesia, without a simultaneous operation, will cause a reduction in the oxygen-carrying power of the blood of from 10 to 25 per cent.

This occurs in from 24 to 48 hours after anesthesia, and the blood does not return to normal in from six to seven days. Ether is supposed to produce a similar effect. Now, if we may expect the ordinary patient to show an actual red cell capacity of only 74 per cent of the normal, if we further reduce this by 25 per cent, due to the anesthesia alone, we then have before operation less than 50 per cent actual oxygen-carrying value. Seventy per cent may not cause apprehension to many surgeons, but less than 50 per cent is surely cause for serious consideration.

If, in addition, we realize that this percentage may further be decreased by hemorrhage into the tissues, due to surgical shock, or to loss of blood from other causes, we must approach the problem of operation with a greater appreciation of the risk to be met. We shall prepare the patient with greater care, and we shall be more circumspect in our prognosis.

Prior to operation we should use, more and more, the recognized agents to correct anemia and to produce the normal fluid balance, such as repeated transfusions of whole or citrated blood, fluids intravenously and subcutaneously, by mouth or by rectum, opiates to relieve the nervous apprehension which in itself may produce shock; thermal and chemical agents, as well as glandular products to control blood pressure and capillary bleeding. We should operate as rapidly as possible, and in many cases in stages, doing as much each time as the patient's condition warrants. We should guard against sudden postural changes of the patient, as it has been shown that cerebral anemia so severe, especially in the aged and infirm, as to cause death, may be induced by merely changing the patient on the operating table from a reclining to a sitting posture. We should not neglect to profit by our experiences of the past in meeting the problems of the present.

Unfortunately, we can have no definite standard as to what degree of anemia may in every case contraindicate certain operative measures. Much will depend upon other factors influencing the physical condition of the patient, the duration of the anemia, the skill, equipment and surgical judgment of the surgeon. It is well recognized that barring the presence of surgical shock, sudden massive hemorrhage such as one sees in ruptured ectopic pregnancies, upon control of the bleeding responds far more rapidly to treatment than the same degree of anemia which is the result of small hemorrhages occurring over a considerable period of time. In some of the latter cases the bone marrow, liver, kidneys, heart and blood vessels show beginning aplastic degenerative changes. Such an anemia sometimes follows chronic uterine hemorrhage, associated with uterine fibroids. The ideal surgical blood picture is of course that of the normal blood. We may say that, barring other considerations, the surgical risk increases in direct proportion to the degree of anemia.

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PRE-OPERATIVE PRECAUTIONS IN OTO-LARYNGOLOGY*

By PINKNEY V. MIKELL, M.D., F.A.C.S.,
Columbia, S. C.

The best method of handling post-operative complications in oto-laryngology is not to have any, if possible. Pre-operative precautions which do away with post-operative complications are of more practical value than much skill brought to bear in combating these same complications after they arise.

The first requisite in this specialty, as in any other, is that the physician who limits his work to oto-laryngology should have the best training possible in general medicine and surgery, and should be a capable physician, both before and after limiting his work to this special field. There is probably no special branch of medical practice, with more men that are unfitted for it by lack of adequate training, trying to "carry on," than in oto-laryngology. In a series of 500 mastoid cases reported by Keeler at Washington last Spring, there were dozens of patients who had had previous "mastoidectomies" without ever having the antrum entered, and I doubt that there is a man within the sound of my voice who has not had at least one similar experience. As someone wisely said long ago: "A specialist is a man who knows something about everything and everything about something."

When a man well grounded in general medicine and surgery decides to specialize in oto-laryngology, he should supplement his general knowledge of medicine by the most complete special training he can command. He cannot qualify by taking an "intensive course" of a few weeks, or a hurried flight through a few foreign clinics; but this practical experience should be obtained by long and arduous work in the clinics under the supervision of the master teachers.

IMPORTANCE OF THOROUGH PRELIMINARY EXAMINATION

Every well trained physician knows the importance of thorough preliminary examination, no matter what the problem presented may appear to be; yet it is astonishing how often such examinations are omitted or negligently done upon oto-laryngological patients. Especially is this true of tonsillectomy. That this is a serious surgical operation which needs to be surrounded by every surgical precaution, appears to be unrecognized by the majority of operators and patients alike. A world renowned internist once stated that he knew at least fifteen surgeons whom he would trust to remove his appendix, but he knows only three men whom he would trust to do a tonsillectomy upon him. A urologist would not think of removing a kidney which he believed to be diseased, without first using every known means of determining the exact nature of that disease and investigating the entire physical state of his patient to find out if there were any contraindications to the removal of that kidney. Especially would he search for concurrent infections which might have a bearing on the renal condition, even if they were not directly connected with it.

To cite but a single danger, consider the risk of disseminating such an infection as tuberculosis, which may speedily end the life of the patient thus inadvisably operated upon. Of 1000 tonsillectomies done at Johns Hopkins Hospital, examination of the removed tissues showed tubercle bacilli in 46, or about 4.5 per cent. Mitchell, of the Royal Hospital for Sick Children, Edinburgh, examined the material obtained by 206 tonsillectomies: 106 of these patients had tuberculous cervical glands, for the removal of which they entered the Hospital; 100 patients were operated upon under a diagnosis of tonsillar hypertrophy, though "in all cases the lymph glands behind the angle of the jaw were palpably enlarged." Of this, Mitchell states that "The enlargement is of a toxic nature and is to be differentiated if possible from early tuberculosis of the tonsillar gland." In the first group of 106 cases, 41 proved microscopically to be tuberculous; of the second group, 9 out of 100 subjects were histologically demonstrated to have tuberculous tonsils, though there was no clinical evidence of tubercle bacillus infection. In Weller's study of the incidence of tonsil tuberculosis, made at the University Hospital, Ann Arbor, Michigan, the histologic examination of the material removed in 8697 tonsillectomies, including in practically all cases both faucial tonsils and adenoids, showed active tuberculosis in 204 instances, a case incidence of 2.35 per cent. The author remarks that "The large number of medical students, internes and nurses who have had unsuspected tuberculosis of the tonsils

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has been an interesting feature of this investigation." All these investigators remark upon the practical impossibility of determining whether or not a tonsil *in situ* is tuberculous.

How, then, can careful pre-operative examination restrain us from taking out tonsils so infected? It cannot always do so, but in many cases examination may reveal the true condition, which would lead us to take extra precautions lest infection be disseminated. Still oftener it would uncover undoubted clinical evidence of tuberculosis elsewhere in the body, perhaps so small and quiescent a focus that hasty inspection would overlook it altogether.

Never should the oto-laryngologist operate upon a patient whose physical condition is vouched for by someone whose ability and scientific thoroughness can be even remotely questioned. All such procedures should be carried out in a properly equipped hospital, and the patient should enter it at least twelve hours before the time set for the operation. He should have a careful history taken, physical and laboratory examinations, and, if there is any doubt in the examiner's mind as to the presence of pulmonary tuberculosis or enlarged thymus, the x-ray should also be used.

The choice of an anesthetic is one of the most important features of an operation, and the question of what is most suitable in tonsillectomy has been warmly discussed for many years. I consider local anesthesia preferable for operation upon adults. Other things being equal, local anesthesia is less hazardous to life, though we should expect a higher mortality rate under it, because it is often used upon poor risks who cannot stand general anesthesia. As a matter of fact, it is shown by statistics from such clinics as the Mayo that the mortality rate is actually lower. At Rochester practically all adult tonsillectomies are done under local anesthesia. Of course, the preparation for anesthesia should be just as careful and thorough when local is to be used as if gas-oxygen or ether were the anesthetic contemplated. This omission has cost more than one patient his life.

The administration of local anesthesia is susceptible of certain refinements which make for greater safety and increased comfort for the patient. Half an hour before operation a hypodermic injection of morphin and hyocin should be given, and when the patient reaches the operating room he should be placed in a semi-recumbent position and made as comfortable as possible. Everything should be quiet and unhurried and all signs of preparation kept out of his range of vision. It is beyond the province of this paper to discuss the best methods either of operation or anesthetic technic, but a few "pointers" which I have picked up in the course of my experience may not be unwelcome. After each insertion of the needle into the tissues around the tonsil, wipe off the point with an alcohol sponge. During the operation, if the bleeding is annoying, the method of pressing the tonsil back into the fossa, a simple expedient to which we are greatly indebted to Dr. Joseph Greene, of Asheville, for bringing to our attention, is a most effective way of controlling oozing. Pain may be relieved and the tendency to hemorrhage lessened by making a superficial injection of a weak solution of urea and quinin into the fossae after the tonsils have been excised.* Most patients get through the first twenty-four hours after operation more comfortably if they are given morphin in moderate doses as the conditions indicate.

Anesthesia in Children.—When operating upon children, ether vapor has proved the most serviceable anesthetic in my experience. While the patient who is to be operated upon under local anesthesia may be allowed a little coffee beforehand, all foods and fluids should be withheld when ether or other general anesthesia is to be used. We seldom use any preliminary analgesia when the patient is a child. The use of general anesthesia increases the danger of the inhalation of septic material and, with the cough reflex abolished, the chances of setting up conditions favorable to lung abscesses are enhanced. The employment of the Trendelenberg position will aid in avoiding this particular danger, and I invariably use it in all general anesthesia cases. A good suction apparatus is also essential.

Operation Upon Tuberculous Patients.—A problem often presented is the removal of tonsils of individuals known to be suffering from definite tuberculosis, pulmonary or otherwise. The tuberculous patient is just as likely to present surgical conditions unrelated to his systemic infection as is the non-tuberculous. He may have an inflamed appendix, a gall bladder full of stones, or a fractured radius. Very often he has infected tonsils, which is a focus of infection quite separate from the tuberculous one, serving to lower his resistance and lessen his chances of recovery. What shall we do for him is often a great problem.

The majority of authorities upon tuberculosis

*Have discontinued use of quinin and urea since paper was written and read.

say dogmatically that such patients should not undergo operation unless it is frankly a life-saving measure. Those who concern themselves especially with genito-urinary tuberculosis are less conservative; many of them, indeed, regard surgery as the only hope in tuberculous lesions of the kidney and its related organs. This, however, differs somewhat from subjecting a tuberculous patient to tonsillectomy, even when it is done under local anesthesia. Yet Scarff and Whitby, of the Middlesex Hospital, London, are most emphatic in advocating tonsillectomy in children with tuberculous adenitis, especially if the infecting organism is of the bovine type.

While they "do not contend that tonsillectomy is a preventive of tuberculous adenitis, nor that this forms a justification for the operation," the cases which they present would seem to "show that it tends to bring about improvement where the glandular condition is early, and emphasizes the necessity for tonsillectomy in all cases where removal of tuberculous glands in the neck is necessary. Without tonsillectomy, a focus of infection remains active."

Crowe and his co-workers advocate operation on "latent" or "apparently arrested" tuberculous cases, inasmuch as the "detrimental effects * * * of acute infections of the respiratory tract seem to justify any operative procedure that will lessen the frequency of these acute attacks."

Brooks, of the United States Veterans' Hospital at Whipple, Arizona, believes that the psychic effect of even a minor surgical procedure may often help the patient to make a better and more determined effort to get well. He emphasizes the need of making an individual study of each tuberculous subject for operation, and favors the use of local anesthesia, with extensive nerve block for laparotomies and similar major procedures. Newhart, of the Glen Lake Sanatorium, Minneapolis, is one of the few to come out strongly in favor of doing tonsillectomies on tuberculous subjects. Among 1490 admissions to his institution during a six-year period, 122 tonsillectomies have been performed, 81 on adults under local anesthesia, and 41 on children under a general anesthesia. "A painless, speedy, clean operation with the minimum amount of traumatism, hemorrhage and gagging is always sought * * *. All patients are carefully selected by the resident staff as to their fitness for the operation, special attention being given to temperature and clotting time."

According to Maxeiner, "It has been a revelation to see how well tuberculous patients endure surgery under local anesthesia. * * * In some instances there has been actual improvement, due to the enforced rest and the fact that any patient can combat one lesion better than two."

Illustrating my contentions for better preoperative precautions in oto-laryngology, I give two brief case reports:

Mr. S. F. S., age 35, was brought to Columbia Hospital by his family physician, with the diagnosis of infected tonsils.

His father and mother, five sisters and one brother were all living and in good health. He gave no history of tuberculosis, cancer or insanity.

His general health had been good prior to the present illness. He had measles, mumps, whooping cough, influenza, typhoid fever, tonsillitis, stomatitis, some cough, and, at times, night sweats. His usual weight was 120 pounds; his weight at that time was 116, and his height 5 feet 9 inches. He had had no injuries and no operations.

He had had several attacks of tonsillitis in the previous three years. There was one bad attack in February, with some fever. He was in bed for a week, but had had sore throat several times since.

Upon examination an undernourished man was seen lying in bed. The skin and mucous membranes were clear, glands negative, reflexes normal, head, eyes, ears, nose and mouth negative. The throat was injected, the tonsils infected and adherent. The lungs and heart were clear upon auscultation and percussion. The blood pressure was 105/55, and the abdomen negative.

The next morning, with the above clear bill of health from the examiner, I operated under local anesthesia. He had no unusual disturbances for two weeks, when one night he had a marked pulmonary hemorrhage which necessitated sanatorium treatment. His physician informs me that this man gained weight to 150 pounds and lived for two years in fair health. Dissipation, plus his infection, caused his death two months ago.

Case 2.—Mrs. M. S. W., age 24, came to me with the diagnosis of infected tonsils. She had had frequent sore throat for the preceding year.

Her family history was essentially negative.

Her general health had been good prior to the present illness. She had had measles, mumps, influenza and malaria, tonsillitis and pharyngitis. At the time she had a slight cough and some shortness of breath upon exertion. Her appetite was good. She had two children.

Her usual weight was 110 pounds, and her present weight is 110 pounds. Her height was 5 feet 4 inches. She had had no injuries and no operations.

During the preceding year she had frequently had sore throat. About three weeks before I saw her she developed a cough and, shortly afterward, sore throat.

General examination showed a well nourished young woman. The skin and mucous membranes were clear. There were no glandular enlargements. The reflexes were normal. The eyes, ears, nose and throat were negative. The heart and lungs were clear upon auscultation and percussion. The blood pressure was 110/60. In the abdomen were no masses, tenderness or rigidity.

May 23, 1927, adeno-tonsillectomy was done under warm ether anesthesia. After five days I left for a ten-day vacation. On my return I found her with fossae unhealed. A physical examination done at this time revealed rales in both apices and tubercle bacilli were found in the sputum. She has been in a sanatorium since that time and is now in a dying condition.

In conclusion, each operative case should be examined with the same thoroughness that a general surgeon employs in his cases. We should, at all times, cooperate to the fullest extent in doubtful cases with the internist and the pediatrician, remembering that no case is a "preferred risk." If every precaution is taken, and we

should have fatalities, which we will all have, regardless of every precaution, at times, it is a great comfort to know that we have put into practice the teachings of the Golden Rule.

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DISCUSSION (*Abstract*)

Dr. Eldred B. Cayce, Nashville, Tenn.—The general examination should always be made by an internist for the best interests of the patient. This is in keeping with the spirit of specialization.

The latest definition of a specialist I heard recently was this: "A specialist is one who knows more and more about less and less."

The essayist dwells on the question of whether to do a tonsillectomy on tuberculous patients, a question that will always bring on much discussion. I can imagine nothing worse for a young adult who has an incipient tuberculosis with an increased pulse rate than to undergo a tonsillectomy, either local or general. After the acute condition is arrested, if repeated attacks of tonsillitis occur you are justified in doing a tonsillectomy. I have seen more than one patient whose life I thought was very much shortened as a result of a tonsillectomy. There is a certain amount of shock, and the restricted intake of fluids, and the effect of a small amount of food for several days to a week, seems to have a bad effect.

I agree with the essayist that a tonsillectomy is a major operation and should be done in the hospital, and the patient should be in the hospital twelve hours before the operation. But in private practice, unfortunately, we have to be swayed to some extent by the wishes of the patient. If you insist upon his going to the hospital the night before to carry out the ideal arrangement, a certain number of patients will go to somebody who will do the operation on a few minutes' notice in the office.

For several years I did no surgery in my office, and numbers of my patients went to other men who did operate upon them where they wanted to be operated upon, which was in the office.

Of course, the expense plays a part, but the fright and prejudice against a hospital also play a large part in children and in many adults.

I shall speak of the pre-operative attention for a local tonsillectomy. Years ago I gave morphin and atropin, but later thought the addition of atropin with adrenalin was not good, so discontinued the atropin. Later I used the method advised by Crile, with scopolamin, morphin, and atropin, and then followed the tonsillectomy with quinin and urea. It was an ideal method when it worked, but I nearly lost one patient, and became afraid to use the scopolamin. I had two patients whose tonsil fossae became a sloughing mass after the injection of quinin and urea, so discontinued it also. When several drugs are acting, some given hypodermically, and an application of cocain is made with the injection of novocain, it is difficult to tell what is causing the trouble. The fewer the drugs used, the better opportunity you have to combat any toxic symptoms that may occur.

I am now using one of the barbital preparations, luminal, giving three grains thirty minutes to an hour before operating, which seems to me to work better than scopolamin, morphin, and atropin.

In giving anesthesia to children, if a mouth gag is used with a tongue depressor that pulls the tongue up and makes pressure towards the hyoid bone, the blood that gets into the throat is swallowed rather than inspirated. I use a Cullom mouth gag and have never seen a lung abscess where the gag was properly used. Of course we employ suction.

I have used the method suggested by Dr. Green to control hemorrhages, and there is a certain element of danger because you have a friable tissue held with a pair of forceps, and if you make much pressure it may come off. I have been in constant fear of having the larynx blocked off with a foreign body. I have been frightened once or twice, and feel that the method is safer to use under local than under general anesthesia.

When you expect to do any intra-nasal surgery and a tonsillectomy, unless you do both at the same time, always do the tonsillectomy first. There is nothing more trying than a tonsillitis complicating the convalescence of a patient.

It is unfortunate that in private practice we cannot carry out in detail an ideal scheme pre-operatively. It is of value to keep in mind the safest procedure, and to attempt as far as possible to carry that out.

I feel sure that there is not a man here who has not at times, when a patient has gone to the bad, or complications have arisen, realized the value of a careful physical examination. If a complication does occur, you have in a way shared the responsibility with the internist who has made the physical examination; and you have someone to help you out who is especially interested in the patient. It is not a question then of consultation with the family to find out whom they want to see the patient with you, and you have no decisions to make yourself, as the choice has been made.

The longer one practises the less is he inclined to consider any surgery as minor surgery. Ordinarily, if you tell a patient that once a year he needs a general physical examination, sick or well, he will cooperate with you.

After hearing the two case reports, I wondered if an x-ray of the chest of both of those patients would not have made the diagnosis of tuberculosis positive. It is inconceivable that a case of tuberculosis should advance to the point of a hemorrhage in two weeks, as in *Case 1*, and a positive smear and sputum in three weeks, as in *Case 2*.

Dr. Joseph B. Greene, Asheville, N. C.—I wish to

confine my remarks entirely to the pre-operative care of the patient for tonsillectomy. We must bear in mind that the operative technic is highly important as affecting operative complications.

I would emphasize in the first place the taking of a thorough history of the case; especially as to cough, temperature, and loss of weight. Should there be anything suggesting active tuberculosis, then a competent internist should be consulted. Unless this examination is most thorough, making use of the x-ray of the chest in many cases, we are apt to be misled. In my experience, a persistent temperature is seldom caused by chronically diseased tonsils, and continued pain on swallowing should suggest a thorough examination of the larynx for a tuberculous lesion. A number of patients come to our Section with active tuberculosis of the lungs and larynx as well, who have had their tonsils removed for pain or hoarseness. I should not be too critical of my colleagues who have made this error, for I once made the same blunder myself. It is our policy in this locality not to remove tonsils in patients suffering with active tuberculosis. When called upon to perform this operation in cases of great urgency, as severe arthritis, a local anesthetic should of course be used. This applies to adult tuberculosis.

In cases of latent tuberculosis of the tonsils and adenoids, as seen in children, there is no special contraindication for tonsillectomy. It is desirable to build up the general health of these patients as much as possible with such measures as exposure to the sun rays, adjusted diet, and cod liver oil. This type of latent glandular tuberculosis of children presents a very different type from that of adult tuberculosis previously considered.

There is another precaution which should be considered; that is the taking of the patient's temperature just before operation. It is not only necessary to have it taken, but it is equally necessary for the nurse to report to the operator a rise of temperature above 99°. A failure on the part of the nurse to make this report to me brought disaster to one of my patients during the recent summer.

In my opinion it is neither necessary nor desirable to place patients for local tonsillectomy in the hospital the night before operation, provided all necessary examinations have been made, the patient feels well at the time of operation, and has a normal temperature. The patient approaches the operation in a calmer frame of mind when he has not had the seriousness of the operation accentuated by a night spent in hospital surroundings.

The patient should not come to the operating room until every detail of preparation has been completed. Encouragement should be given the patient during the operation, thus lessening the nervous anxiety, a prominent cause of surgical shock.

Dr. Oscar Wilkinson, Washington, D. C.—I agree with Dr. Greene about bringing all patients to the hospital. Where the patient resides in the city he will often rest better the night before if he is permitted to stay at home.

As to preparation, I certainly agree with the essayist. Also, every patient who is to be operated upon early in the morning should have his temperature taken before he is brought to the operating room.

I do not believe that it is good surgical practice to place the tonsil back in the fossa. If the tonsil is seriously diseased and requires removal, why put the diseased tonsil back into the wound? Is it not poor surgical technic? In the first place, if we have hemorrhage the time to stop it is on the operating table. It is immensely easier to throw a ligature over a bleeding point while the patient is on the table than it is later. Then why put the tonsil back and smear up the wound with a piece of infected tissue, when your duty is evidently to put a ligature over the bleeding tonsil? In order to do this I have practically eliminated adrenalin in my tonsil operations. I now use only one drop of adrenalin in the whole solution, and I often omit it entirely. It enables me to find the bleeding points and to throw a loop over them. It is very easy to put a loop over a bleeding point if you use the technic devised by Coakley, of New York, a few years ago.

The idea of injecting quinin-urea into the back of the tonsil I think is also objectionable. Why traumatize the tissue, knowing that the patient recovers more rapidly the less the traumatism?

I should like to ask the essayist if he has any statistics showing what percentage of general infection follows the operation upon tuberculous children?

Suspected tuberculous patients demand very careful pre-operative examinations. If the temperature is taken over several days it will usually locate the tuberculous case.

Dr. E. H. Cary, Dallas, Texas.—I wish to speak of only one phase of the subject, pre-operative diagnosis. It seems to me that we oto-laryngologists must definitely assume the responsibility for the diagnosis of our cases. We should be certain of our own cases. If there is a fatality or if something happens to the patient, we always find in the final outcome that we cannot get under cover, that we are held responsible, particularly if we have operated. So I have felt that we must change our practice somewhat. We must be more certain that we have surrounded the patient with all the facilities and with all the mechanical arrangements, so that we can assume the responsibility of diagnosis.

That does not mean that we ought to exclude from our service a good internist; it means that we will turn more and more to the good internist; but instead of being brought in ourselves, we will go out and bring in the internist, to work more constantly on our cases so that we may know more about the physical condition of the patient before we operate.

The x-ray man many times can be of great service, and the cost to the patient should not deter you from using him. His fee, although justifiable from his standpoint, frequently proves a barrier to his use, for the patient may be embarrassed in paying both you and the roentgenologist. Under such circumstances, if you have an x-ray plant in your own office, the question of the expense of one plate is only $3.00, and you more consistently have these cases x-rayed because the cost amounts to nothing compared to the satisfaction that you have in knowing that you have all the information that the x-ray man could give you.

I believe we must change our ideas of the practice of medicine. We are no longer the receivers of many patients, because the general practitioner and surgeon are doing the very things we do. Therefore, we must look at our patients as belonging to us and assume all the responsibility for them.

Dr. Homer Dupuy, New Orleans, La.—Acidosis quite frequently follows a general anesthesia, especially ether. It may prove simply uncomfortable, or may continue

as a rather serious post-operative complication. We can certainly reduce both eventualities by pre-operative administration of alkalies and sugars. Several days before contemplated operation I give alkalies and sugars as a routine measure. We do this in all our tonsillectomies and adenoidectomies with most gratifying results. In adults plus the alkalinization, we give morphia grains 1/4, with scopolamin, grains 1/50, one hour before the operation. This gives a twilight-sleep effect, and greatly facilitates the first stage of general anesthesia. In this age it does seem unpardonable to have a too prolonged session of post-operative vomiting, and other serious sequels, now attributed to acidosis.

Dr. Mikell (closing).—A hypodermic of morphin, and hyoscin, preliminary to operations on the sinuses or tonsils is an ideal combination for local anesthesia. Dr. Crile is credited with the statement that hyoscin and morphin given before the anesthetic put the patient in a neutral state of mind.

I have used Dr. Greene's method of controlling tonsil bleeding, and it keeps the oozing down to practically nil. He very seldom has to use a suture ligature, and I have had the same experience, especially in tonsillectomy upon children. So do not condemn this method until you try it out. The infected part of the tonsil does not come in contact with the fossa.

In 1000 cases at the Columbia Children's Clinic with this careful pre-operative work, physical examination, history, laboratory tests, blood clot, all made, we have had but one case of bronchopneumonia and one case of pneumonia, both of which recovered.

We still think that adults should go into the hospital the night before operation. It is not best for them to get up in the morning, stir around and raise their blood pressure in an effort to get to the hospital on time. They go through the operation more comfortably if they come in the night before. Children, however, may come in the same morning.

I am sorry I cannot answer Dr. Wilkinson's question, as I have no statistics of that kind.

I thank Dr. Dupuy for his point about alkalinization. We give orange juice just as soon after the operation as the patient can retain it. Acidosis is due more to purging and dehydrating the patient than to anything else. We have practically corrected that by giving milk of magnesia the night before and an enema the morning of operation.

I appeal for a greater spirit of cooperation between the otolaryngologist, the pediatrician and the internist, and would like to cite a case that many probably saw in Washington eighteen months ago when taking the examination of the Board of Otolaryngology.

A middle-aged colored man in apparently good physical condition was shown who had lost his speaking voice for six weeks. The family history was essentially negative. Choir singing was his avocation. He gave a history of syphilis several years previously. He had had very slight loss of weight. He seemed very well except for hoarseness. The nose and throat were essentially negative except for a beefy red right vocal cord which was practically immobile; the arytenoids were not involved. The temperature and pulse were normal. Upon stripping him to his waist I found a well nourished man in apparently good physical condition with rales in the intrascapular region. His Wassermann was negative (reported). We were not given an x-ray report of this man. Was this a case of tuberculosis, malignancy, syphilis, mixed infection, or what?

Upon a visit to the University of North Carolina at Chapel Hill once to see a student there, I found over his bed the motto: "Lord, help me to be the man others think I am." I should like to paraphase that with: "Lord, help us to be the doctors that our patients think we are and have a right to expect us to be."

RELATION OF THE LABORATORY TO THE STANDARD MILK CONTROL CODE*

By T. W. KEMMERER, M.S., M.D.,†
Jackson, Miss.

Under the standard milk control code, milk is graded not alone on the laboratory findings, as was formerly done, but also on the health of the cows, the sanitary condition of the dairy, and the health of the personnel. The grades are recorded as A, B, C, and D. The sanitary requirements for Grade A raw milk briefly stated are as follows:

The cows must be tuberculin tested.

The dairy barn must have at least three square feet of window space and five hundred cubic feet of air space per stanchion. The floors must be made of concrete or other impervious material and must be kept clean. The walls must be kept clean. The cow yard must be graded, drained, and kept clean. Manure must be removed and stored in such a manner as to prevent the breeding of flies therein.

The milk house or room must be separate from the dairy barn. The floors must be of concrete or other impervious material. The walls must be finished in such a manner as to be easily cleaned. The room must be well lighted and ventilated and all openings must be screened. It must be kept clean and free from flies.

Toilets must be of sanitary construction.

The water supply must be adequate and of a safe sanitary quality.

All utensils must be of such construction as to be easily kept clean. They must be cleaned after each usage, sterilized by steam or chlorine, and stored in such a manner as to prevent contamination.

At the time of milking the udders must be clean, the flanks free from visible dirt, the milkers' hands clean, rinsed with a disinfectant and dried. The clothing must be clean, also the milk stool. Each pail of milk must be removed immediately to the milk room. The milk must be cooled within one hour to 50° F., or less, and maintained at or below that temperature until delivery, unless it is delivered to a milk plant for pasteurization or separation, in which case it must be cooled or pasteurized within two hours of the time of production.

Each individual of the personnel must pass a med-

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†Director of Laboratories of the Mississippi State Board of Health, Jackson, Miss.

ical examination by the health officer at least once each year.

The average bacteria count must not exceed 50,000 per cubic centimeter.

The sanitary requirements for Grade B raw milk are the same as for Grade A, with the exception of certain less stringent regulations in regard to the dairy barn, and that the cooling temperature is changed to 60° F. The average bacteria count must not exceed 200,000, or the milk must fall in class I if the reductase test is used.

The sanitary requirements for Grade C raw milk are less stringent than for Grade B, and the average bacteria count must not exceed 1,000,000, or as an alternative, the milk must be within class II, as determined by the reductase test.

Grade D raw milk is milk which does not meet the requirements of Grade C and whose average bacteria count does not exceed 5,000,000, or which falls in class III, as determined by the reductase test.

Grade A pasteurized milk is Grade A or Grade B raw milk pasteurized and handled according to specified regulations, the average bacteria count of which does not exceed 50,000.

Grade B pasteurized milk is Grade A, B or C raw milk pasteurized and handled under slightly less stringent regulations than Grade A pasteurized milk, and the average bacteria count of which does not exceed 100,000.

Grade C pasteurized milk is that which does not meet the requirements of Grade B pasteurized milk, and the average bacteria count of which does not exceed 500,000.

A more detailed statement would confuse rather than clarify the subject as now considered.

The essential point which it is desired to bring out in the present discussion is that there are various requirements for each grade, and the failure to comply with any one of these requirements excludes the milk from that grade.

For example, to meet the requirements of Grade A raw milk there must be at least 500 cubic feet of air space for each stanchion. If all the requirements for Grade A milk were met except this one, the milk would fall into Grade B. Again, tuberculin testing is required for both Grades A and B raw milk. Should all the requirements for Grade A be met except this one, the milk falls into Grade C.

Milk meeting all the other requirements of Grade A raw milk cannot be so classed unless the average bacteria count is under 50,000: Grade B under 200,000, Grade C under 1,000,000, or Grade D under 5,000,000.

The above brief outline of the requirements of the code is to call attention to the importance of the reliability of each step of the inspection and laboratory work. A standard method is laid down for each laboratory procedure, as for instance in making the bacteria count, and unless this procedure is followed without the slightest deviation, comparable results cannot be obtained by different laboratories. Again, if the count is not reliable an injustice may be done either to the producer or the consumer. Should the laboratory give an incorrectly high count the dairy may be degraded on this single error. On the other hand, a correct count which is high in comparison with the findings of the inspection indicates that something may have been overlooked such as the cleanliness of the less readily accessible parts of the milking apparatus, or there may have been an infection of the udder not determinable by inspection. It is sometimes extremely difficult to find the defect which defeats to a greater or lesser degree the effort to meet the requirements of the ordinance.

It is surprising how closely the report of the inspection and the report of the laboratory parallel each other when the work of both is well done.

The making of the bacteria count would appear at first sight to be a rather simple procedure. But it is difficult to impress upon technicians that each step should be carried out with the greatest precision in absolute accordance with the standard method; that, regardless of personal opinion, the standard method must be adhered to since the accepted counts are based on results as obtained by use of the standard method. The usual error is in making too low a count due to faulty lighting of the plate and improper use of the magnifying glass, the details of which cannot be gone into at the present time.

The standard ordinance requires that milk of all grades contain not less than 3.25 per cent of butter fat and not less than 8.5 per cent of solids not fat.

The determination of the percentage of butter fat presents no particular difficulty if the proper apparatus is used, makeshifts are not resorted to, and reasonable care is exercised.

The accurate determination of solids not fat

presents more difficulties. The routine determination of solids not fat is by the use of a formula based on the per cent of butter fat and the specific gravity of the milk. Small deviations in the percentage of butter fat are of slight significance. But small errors in the reading of the lactometer will result in a relatively large error in the determination of solids not fat by formula. And here we meet with two difficulties: the lactometers generally used are not sufficiently accurate and not calibrated in small enough units, and it is difficult to read a lactometer accurately. The error in the lactometer reading should not be more than plus or minus 0.5 of a point in the third decimal place. The reading of the lactometer should be recorded to the fourth decimal place, and the correction for tempertaure should be made also to the fourth decimal place.

The importance of the solids not fat has not been sufficiently recognized. Too much emphasis has been placed on butter fat, especially since milk is paid for by creameries and pasteurizing plants according to the amount of butter fat per pound of milk. The solids not fat are of as much importance to the consumer of milk as the butter fat.

It is not uncommon for the producer selling to a pasteurizing plant to believe that he is not credited with the full percentage of butter fat and paid accordingly, and it is known that sometimes water is added to the milk to increase the quantity to make up for the low percentage of butter fat credited. Although the consumer may get his just amount of butter fat, he does not get his just amount of solids not fat.

There is some reason to believe that the reductase test may give a more accurate index of the sanitary condition of the milk than does the bacteria count. But more work must be done on the problem before this can be stated definitely. The reductase test requires less skill than does the bacteria count, and is less time-consuming.

The adoption of the standard milk ordinance necessitates that the laboratory work be done locally. Frequently there is not enough other laboratory work to justify the establishment of a laboratory with a highly qualified and high salaried personnel, and frequently it is difficult to find technicians for the smaller laboratories, who can and will do the work accurately, at the salaries which can be paid.

SUMMARY

(1) Attention is called to the fact that the grading of milk under the standard milk control code is based on a number of requirements, failure to meet any one of which may lower the grade of the milk, although all other factors may place it in a higher grade.

(2) Because of this an incorrect bacteria count by the laboratory may negative all the work of the inspector and do an injustice to the producer or consumer.

(3) Although the bacteria count is a relatively simple laboratory procedure, to be accurate it must be carried out with the greatest precision. The importance of this cannot be emphasized too strongly.

(4) The determination of butter fat presents no particular difficulties, but it must be made accurately.

(5) The determination of solids not fat as carried out at the present time is not entirely satisfactory due to the difficulty of obtaining suitable lactometers and the difficulty of reading them accurately.

DISCUSSION (*Abstract*)

Dr. William Litterer, Nashville, Tenn.—Although the standard may not be ideal in every particular, we must stick strictly to the standard code.

Suppose you fail to give the tuberculin test; then such an infraction should throw the milk to a lower grade and rightly so. Conforming to a strict standard is especially necessary in laboratory technic of milk analysis. Just as an illustration: the standard test says to shake the diluted milk twenty-five times in about seven seconds. This may sound foolish, but if you shake the same milk 200 or 300 times you will get a very much higher bacterial count. So therefore let us stick to a standard technic.

There is a real problem in the future for the director of any state laboratory. Many small towns are establishing the standard milk ordinance. Some of these towns are too far removed from a well established laboratory to make a satisfactory milk analysis. The analysis must be made somewhere in the town. The real problem is to obtain competent technicians or bacteriologists to do the work. Many have the impression that a clerk assistant or stenographer can make a satisfactory milk analysis, and at the same time do other duties in the office. I grant you that almost any one can make a satisfactory milk analysis if properly trained. But no one can make a satisfactory analysis of milk if there are interruptions during the time the analysis is being conducted. Answering phone calls and doing other duties in the office can be done only after the

completion of the analysis. My program for the future in dealing with the clerk-technician of small towns is first to pass upon his capability and then to have a distinct understanding with the management that the clerk-technician is to give first consideration to the analysis of milk, and that no interruptions shall take place during the analysis.

Dr. W. A. Claxton, Miami, Fla.—I think the ordinance is most valuable in virgin soil; that is, where you have had no ordinance before, especially in small towns, and in large towns where an efficient health department has had control.

It is a little too complicated, inasmuch as you have too many grades of milk. I think milk should be suitable for consumption in a raw or pasteurized state, and if milk is not suitable to be consumed raw it should be pasteurized, and if it is not suitable to be used pasteurized, why it can be used for cooking. That makes your three grades, and either two or three grades is certainly enough.

The question of laboratory control also is rather a difficult one, because Dr. Litterer says that you will have to maintain laboratories in close proximity to production.

Dr. C. W. Garrison, Little Rock, Ark.—If I understand Dr. Litterer's comments, an examination of the milk in the laboratory reveals a higher count than is permissible under the ordinance, which immediately places the dairy in Grade D. Under the standard ordinance this laboratory finding is simply a check or warning and the sanitary inspector should make a re-inspection and collect subsequent specimens for laboratory examination. If the second specimens show the required count the dairy is not reduced to D Grade if it meets other requirements.

One splendid feature of the ordinance is that it takes the dairyman into the confidence of the inspector or control agent and gives him an opportunity to cooperate under instruction.

We all recognize the value of a laboratory as a control agent, but the laboratory findings alone in my judgment play a subordinate role and proper sanitary inspection is of much greater importance. The laboratory, however, is a major factor in milk control.

In my judgment, the standard ordinance should not be passed or made effective anywhere unless there is machinery to administer it properly.

Dr. Roy K. Flannagan, Richmond, Va.—The standard ordinance fully takes into consideration all sides of the question. The producer, the distributor and the consumer are treated fairly, while a safe milk is being insured. Those administrators of public health who have attempted to thrust a milk ordinance on an unprepared set of dairymen or community have received some severe bumps. In setting up the ordinance the idea (emphasized by Dr. Garrison) is always to take the dairymen into one's confidence first. They are producing the milk, a necessity, and they must produce milk if the babies are to be supplied milk; clean milk, if possible, but certainly milk. A considerable proportion of babies live even when they drink dirty milk. Therefore an ordinance must be framed to encourage, not discourage, the production of milk. In inspecting the dairies of our towns and cities where milk ordinances were already in existence, we found at several places (one place in particular where there was a rigid ordinance) splendidly administered inspection systems and a fine, high grade milk distributed, but the children of those communities were drinking canned milk because milk was too high in price. The city in each case had inspected many dairymen out of business and the children were the sufferers.

This standard ordinance is a practical scheme for bringing the dairymen into cooperation with the public health idea, to show them clearly what the public health people are trying to do; not to run them out of business, but to stabilize and dignify the industry.

The standard ordinance is worth careful study for, I fancy, it represents more concentrated thought and more earnest work in trying to balance the commercial side with the health side and give safe milk than any other milk ordinance ever devised. If your city has a good ordinance, providing a safe, abundant supply of milk at reasonable cost, you may not be vitally interested, but if it has not you cannot do better than to put the standard ordinance into effect.

Dr. A. T. McCormack, Louisville, Ky.—In Louisville we passed the standard ordinance, and due to a political flare-up it was necessary to repeal it. Our largest milk distributors have now voluntarily accepted the standards of the ordinance, and they are enforcing it under state legislation voluntarily. It has reduced the price of milk. Milk distributors have stopped paying for their milk on the butter-fat basis, and are paying on the standard ordinance basis. Everything in Louisville will soon be doing this. It has been most gratifying.

Another little scheme we have adopted has been to change the name of our inspectors to "instructors." It changes the whole attitude of the fellow doing the work. He is going out to show how to produce clean milk, not to tell dairymen that they are producing dirty milk. It changes his and their psychology. No man likes to be told he is dirty, particularly if he is!

Dr. Kemmerer (closing).—The ordinance may appear very complicated on first reading, but actually in practice it is not.

The ordinance does not dictate what grades of milk shall be produced. It requires only that the milk be properly labeled according to grade. The consumer is free to choose any grade he prefers. If there is no difference in price, obviously only Grade A will be chosen. This will stimulate the production of Grade A milk, which is the ultimate object of the ordinance.

It was not the intent to convey the idea that a dairy can be graded by a single high count. In each grading period there are four examinations of the milk from each dairy, and the logarithms of the four bacteria counts are averaged. The averaging of the logarithms instead of the original counts gives a more representative index, should a single large deviation occur. In case the dairyman does not meet the requirements for the grade desired, he is given a chance to be regraded.

THERAPEUTIC RESULTS IN PSORIASIS*

By HENRY H. HAZEN, M.D.,
Washington, D. C.

Psoriasis is a common disease, chronic, and difficult to handle. This paper is a review of 167 consecutive private patients, 80 of whom were treated for a considerable length of time, and whose later condition is known.

Psoriasis is distinctly a disease of moods; there are frequent periods of remission or exacerbation without known cause. In many individuals the disease has a distinct seasonal incidence. In attempting to evaluate any type of treatment these facts must be taken into consideration.

X-ray Treatment of the Lesions.—A total of 60 patients received x-ray treatments. Twenty of these had a few treatments as an accessory to courses of some other form of therapy, with the sole idea of starting resolution in stubborn patches. Of these 60 cases 15 were completely healed by the x-ray and 30 were remarkably improved. Twelve patients were unaffected and three were probably made worse. The last three deserve special consideration. In two instances patients with scattered lesions of psoriasis suddenly developed distinct aggravation of the disease after three or four treaments, and in all instances no form of therapy had the slightest effect. Both of these patients gave a very definite history of a similar experience following previous x-ray treatments and both denied that such an aggravation ever occurred under treatment except as a result of x-ray. In the third instance, a patient who was slowly recovering under ointment and non-specific protein therapy stopped all improvement as soon as x-ray was begun, and gradually developed more and more spots, which steadfastly resisted all treatments. This is the class of case which leads some observers to believe that it is possible by the use of the roentgen ray to "fix" the eruption of psoriasis.

One case of generalized psoriasis was cleared by the use of x-ray, although x-ray failed in two similar cases. In a number of individuals the results were remarkable. In two patients the eruption completely disappeared after one treatment. At this point it may be remarked that all patients received uniform dosage, namely, one-fourth of an epilating dose, unfiltered, at weekly intervals. The skin distance varied from 9 to 18 inches.

The x-ray is usually conceded to be the most effective form of therapy that we have at our disposal, but its dangers are becoming more and more manifest. Patients with psoriasis who have shown improvement may go the rounds of physicians until they receive what they consider to be the proper number of treatments. Sooner or later such a procedure ends in disaster, telangiectasis and atrophy. Two of my patients had such experiences. At the present time when the unsympathetic attitude of jurors and even judges is apparent in the case of any markings from the x-ray, all physicians feel that treatments must first be considered from a standpoint of what is safe for the physician. In other words, no man practising roentgen therapy dares use his best judgment for the benefit of the patient. He must first think of his family and of himself, and hold the radiation to a minimum. Not more than three x-ray treatments a year should be given to any psoriatic patient, unless the physician wishes to invite trouble. Under no circumstances should an erythema dose be given. It is advisable not to administer over one-fourth of a unit dose. We are beginning to learn that skin damage may result from too many treatments, even though an erythema dose is never produced. Certainly a total dosage of four units is as much as should ever be administered to one person, even through a period of years. Psoriasis which does not improve markedly after two treatments with the x-ray is not apt to improve with more. In such cases other treatment should be substituted.

X-ray of the Thymus.—Brock, the Foerster brothers, and a number of other observers recommend heavily filtered radiation over the thymus gland. This method of treatment has been tried in ten cases, two of whom were benefited, seven were unaffected, and one became much worse. In all instances the technic used was that recommended by the Foersters. In no instance did telangiectasia result.

Ultra-Violet Ray.—An air-cooled ultra-violet ray was used on twenty-two patients. In ten instances the results were excellent. In eight instances there was no effect whatsoever, and in the other four the results were doubtful. The air-cooled violet ray lamp appears to offer the best chance in the treatment of psoriasis of the scalp. In several instances it has caused the prompt disappearance of lesions in this vicinity.

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The small water-cooled lamp was used on nine patients. Two were somewhat benefited, and seven were not helped in the least.

It should always be remembered that the ultra-violet ray may produce a severe dermatitis and this should be avoided. It seems possible that psoriasis might develop in blisters caused by a severe burn. This phenomenon of a further spread of psoriatic lesions has been observed in blisters caused by the sun.

Ointments.—Chrysarobin was given a fair trial in nine cases. Two patients had rather a spectacular healing of all lesions. In one instance the patient has remained well for two years.

Chrysarobin is objectionable because it is dirty and irritating. Like many others, I have a distinct impression that the drug of today is not so effective as it was some twenty years ago. No doubt the benefits could have been increased had patients gone to a hospital and employed the services of an expert masseur. Various other ointments were given a fair trial. Apparently the combination of salicylic acid and ammoniated mercury has the effect of the other if it is well rubbed in. In two of twenty attempts all lesions were healed by these drugs.

Diet.—There still are those who believe that a low protein diet will cure or benefit psoriasis. Two of my patients, both with severe types of the disease, were total vegetarians, and two others had suffered from a rice diet for a long period of time. The reported benefits from diet have been largely among patients who were in the hospital, and it is more than possible that the change in environment may have been much more responsible than the low protein diet.

Auto-Serum and Whole Blood Injections.—Auto-serum therapy was employed in seven cases, all of which were of more than average severity. In no instance was there any great benefit. In four instances whole blood injections were made and in only one of these could the results be described as good. It should be remarked that neither type of injection resulted in either fever or any evidence of protein shock.

Vaccines.—Another form of non-specific protein therapy is the intramuscular or intravenous use of killed cultures of various bacteria. Autogenous vaccines have proven a dismal failure and staphylococcus, streptococcus or colon bacillus vaccines have likewise been of no particular aid. In two of twelve psoriatics there was some improvement under the use of one of these vaccines.

Typhoid, combined with paratyphoid, has been employed intramuscularly in ten cases. In six instances results were extremely good and in four they were poor. Apparently the vaccine is of no value unless it produces a febrile reaction.

In intractable instances the vaccine has been used intravenously, starting with a dose between twenty-five and fifty million. In almost all instances there has been a shock reaction, with nausea, vomiting, headache, and joint pains and fever. This reaction may follow within one hour after injection. The results were excellent in five cases and doubtful in two. One patient who had suffered from universal psoriasis for nearly two years was completely cured by two intravenous injections.

Intravenous typhoid injections are always unpleasant and even distressing. They should never be undertaken unless the individual or his family are fully informed of the possible sequelae.

Arsenic.—Arsenic in the form of Fowler's solution or cacodylate of soda was used in six patients. In two instances there was reason to believe that some betterment occurred.

Combined Treatments.—In a number of severe cases combined x-ray, ultra-violet ray, and either intramuscular or intravenous injections have been used. Of thirteen severe cases six were much improved or cured and seven were unaffected.

Length of Remissions.—The question of the length of remission produced by various types of treatments is important. There are a number of freak cases in which the x-ray has produced a remission lasting as long as ten years and several cases in which it extended over two years. However, the average time is but six months.

The two cases which were much helped by arsenic remained free or relatively free of psoriasis for about one year. The cases treated by non-specific protein therapy have averaged over one year. This seems a distinct score in favor of the latter procedure.

Generalized Psoriasis.—Cases of generalized psoriasis are notoriously difficult to handle. In this series of cases there were three patients. One was fortunate enough to recover after two x-ray treatments. Another was unaffected by any form of therapy mentioned in this article, although all were diligently employed. A third case was resistant to diet, x-ray, ultra-violet

ray, numerous ointments, auto-serum therapy, whole blood injections, and intramuscular injections of staphylococci and intramuscular typhoid combined with paratyphoid. The first intravenous injection of combined typhoid vaccine resulted in a very slight rise of temperature marked by general malaise. The result upon the skin was beneficial and a second injection, which gave a sharp febrile disturbance, resulted in a spectacular cure, although the condition had already existed over two years.

Psoriasis of the Scalp.—Psoriasis of the scalp is difficult to manage. In this series of cases the scalp was involved in twenty-three instances. The ultra-violet light was useful in only eight of twenty-one instances in which it was employed. The x-ray used in 1/6 to 1/8 unit dosages in weekly intervals greatly benefited five of eight cases, but in all the results were only temporary. Strong ammoniated mercury ointment or a combination of ammoniated mercury with salicylic acid gave no better results. Only two of ten patients thus treated showed any real benefit. The typhoid injections, either intravenous or intramuscular, caused marked improvement in three of six patients. The dosage of x-ray to the scalp must always be light both in each individual dose and in the total dosage for some patients with psoriasis already have a certain amount of alopecia and it takes but a comparatively small amount of x-ray to cause more.

CONCLUSIONS

Since psoriasis is a disease which shows spontaneous remissions, one must be extremely careful about drawing deductions from improvement of cases. However, when only the spots which have been treated with x-ray, ultra-violet light, or some ointment, improve, one can probably conclude that the treatment is responsible. Two methods of treatment stand out as being particularly efficacious. One is the x-ray and the other is the intravenous injection of typhoid vaccine.

Both of these have their advantages and disadvantages. It would seem wise to start treatments in the mild cases with the alpine light or an ointment, and to reserve the use of the typhoid vaccine for severe or intractable cases. The x-ray should be used as sparingly as possible. There is no particular occasion to employ radium in the treatment of this disease, since the patches are always scattered and numerous.

DISCUSSION (*Abstract*)

Dr. George M. MacKee, New York, N. Y.—I have been requested to discuss, particularly, the use of the x-ray in psoriasis. This agent is contra-indicated when new lesions are constantly developing, or exacerbations are frequent, or when the eruption does not entirely disappear as a result of a maximum of six fractional treatments. The x-ray is very useful for the purpose of gaining control of a widespread eruption, after which ultra-violet radiation combined with ointments is used to retain control.

Keeping these contra-indications in mind, I do not hesitate to apply x-rays to the scalp, either to individual lesions or to the entire scalp, using the Kienbock-Adamson fire-exposure method. Here the dose is one-eighth skin unit, unfiltered, once weekly, the maximum number of treatments being four. Also with these interdictions in mind, I think that x-rays constitute the method of election for psoriasis of the nails.

Before applying x-rays to the scrotum it is advisable to examine the semen, because unrecognized sterility may lead to medico-legal complications. A second examination should be made before a second course of treatment is given. Naturally, each course should be limited to four fractional treatments. The courses must be many months apart. The testes should be forced into the inguinal canal during treatment, and protected with lead.

Grenz rays (x-rays of about two angstrom units) are not so effective as are the ordinary x-rays of shorter wave length, but they are especially indicated on the scalp, eyelids and scrotum because of their comparatively slight penetration.

Irradiation of the region of the thymus with filtered x-rays sometimes gives spectacular results. On the whole the method has been a disappointment in my hands.

General medical measures should not be neglected in the management of psoriasis. Severe and stubborn cases can often be handled successfully with rest, diet, removal of focal infections, and attention to the kidneys, heart, and gastro-intestinal canal, when these organs are not functioning properly.

Ultra-violet radiation, either heliotherapy or irradiation by means of a quartz or arc lamp, is very useful. The radiation should be applied daily to the entire body for several months if necessary, and the treatment should be under the supervision of a physician, preferably a dermatologist. Erythema doses should be avoided. I agree with Dr. Hazen that with this treatment, when properly administered, remissions are likely to be of longer duration than with any other method.

Dr. J. L. Kirby-Smith, Jacksonville, Fla.—In my State the detail men for the x-ray manufacturing companies have placed machines at every conceivable medical center, and as a result there is much indiscriminate, inaccurate x-ray treatment of skin diseases.

Psoriasis patients come to Florida with great frequency, having been advised that our sunlight is of benefit to their affliction. From what I have seen, these chronic cases should be particularly advised not to have further x-ray treatment, since permanent damage of the skin is liable to result. It is seldom advisable to treat patients with x-ray when they have been treated by others, unless you know the exact amount of radiation that the patient has already had.

Dr. J. R. Allison, Columbia, S. C.—I should like to call attention to the method of treatment that I advocated yesterday which applies to psoriasis, and, that is, the use of the colorless distillate of tar in combination with quartz light. You will find this method efficacious in the treatment of psoriasis, especially in those cases where you desire to use quartz light.

Dr. E. S. Lain, Oklahoma City, Okla.—I should like to ask Dr. Hazen if he attributes his results with vaccines to local stimulation and resolution, or to anaphylactic shock. If it is the latter, then we are as much in the dark as we ever were regarding protein therapy.

Dr. Hazen (closing).—I believe that it is a great deal safer not to use the x-ray, except under extreme provocation, on the scalp, and possibly only after consultation at that.

Dr. Kirby-Smith brought out an important point, that it is advisable not to treat patients with the x-rays when they have been treated by others, unless we know exactly what the other man did.

Any protein shock, or anything which produces a profound shake-up in the patient will make a change in the psoriasis. It will get either better or worse. I have seen patients get better after a nervous shock, and occasionally one gets worse. I believe that any type of shock therapy, surgical operation, or what not, may change the course of the disease in one way or another.

SEBORRHEIC DERMATITIS OF THE SCALP*

By THOMAS W. MURRELL, M.D.,
Richmond, Va.

Our Secretary has asked for our pet individual treatment. This was taken to mean some procedure which we constantly use with satisfactory results which is not found in the text books. I have chosen seborrheic dermatitis of the scalp, having in mind that form which simulates psoriasis in appearance, with the disagreeable concomitants of intense itching and formication. This is no pleasant syndrome and with the highly nervous and temperamental patient may constitute a situation where prompt relief gains both friendship and reputation.

Walker, of Edinburgh, many years ago contended that psoriasis is only an extremely dry form of seborrhea, and when neorobin was produced by the dermatological research group of Philadelphia and found applicable to psoriasis of the scalp, where chrysorobin is normally interdicted, its use with seborrhea of the same location was a natural step. Neorobin is a product of chrysarobin and is a highly oxidizable drug. It is quickly oxidized in an animal or vegetable fat, and for this reason must be prescribed in a mineral grease base. Further, it deteriorates rapidly in an open container and must therefore be dispensed in a collapsible tube.

The formula usually used is that recommended by Schamberg:

Neorobin	Grains 1-2
Ammoniated mercury	Grains 15
Paraffin	Drams 1
Petrolatum	Ounces 1

Shampooing is a necessity in these cases and the soap used is a German soap containing:

Salicylic acid	3%
Resorcinol	3%
Sulphur	10%

After a preliminary greasing and cleansing of the scalp the following routine is instituted:

Every other day the salve is rubbed into the scalp and on the alternate days there is a shampoo with this soap. Because the salve is fairly expensive and because lavish use is unnecessary, the patient is directed to squeeze out of the tube a small amount on to a hot plate. This allows the patient to apply it as a grease film and to some extent to keep it off the hair. Incidentally, it is almost impossible for a patient to do this for himself, and these instructions, when possible, are best made to some other member of the family who is, in a sense, made the nurse in charge of the case.

This ointment is a heavy grease and does not wash out easily. While under treatment the fair one has to bid good-bye to fluffiness and permanent waves, though the bobbed-haired clientele suffers less in this regard than those who maintain Nature's length. However, the effect of the treatment is so striking that these temporary objections are borne with equanimity. The relief from the sensation of crawling things is so desirable that it is the woman who has been through the folly and the fakery of the beauty parlor who is most enthusiastic. It is my custom, after two weeks, to let the treatment fade out 50 per cent per week for two weeks and then, after a rest from treatment for two weeks, examination is made to see if any repetition is necessary.

*Read in Section on Dermatology and Syphilology, Southern Medical Association, Twenty-Second Annual Meeting, Asheville, North Carolina, November 12-15, 1928.

In carrying out this routine we are using five drugs normally advocated in seborrhea:

Neorobin, ammoniated mercury, salicylic acid, resorcinol, sulphur,

and if shot-gunning be therapeutic treason, then the only possible verdict is to be shot at sunrise. The extenuating plea is, it works. Nay, more, it works so satisfactorily as to come under the classification of a pet treatment.

17 East Grace Street

DISCUSSION (*Abstract*)

Dr. Lloyd W. Ketron, Baltimore, Md.—I cannot say anything about the use of Dr. Murrell's preparation, because I have never tried it. My old standby for seborrheic dermatitis of the scalp is sulphur. I frequently combine it with very minute x-ray doses, which will very much shorten the time of treatment. I believe that small doses of x-ray can be combined with sulphur ointment with perfect safety on the scalp.

I should like to ask what the soap is that Dr. Murrell refers to.

Dr. Cosby Swanson, Atlanta, Ga.—Several years ago my attention was called to the use of neorobin in the treatment of psoriasis of the scalp, and since that time I have used it on a large number of cases, combining it with ammoniated mercury. I find it a very valuable drug in the treatment of this condition. I have also used it in the dry, scaly, chronic type of seborrheic dermatitis of the scalp and in some cases the results were more satisfactory than from the use of sulphur-resorcin ointment. The advantages of neorobin over chrysarobin are that it is less irritating and does not stain the skin. The main objections to neorobin are the cost and the deterioration of the drug.

Dr. E. P. McGavock, Richmond, Va.—I think tar is an excellent remedy for dermatitis of the scalp. It is one of the most reliable remedies for psoriasis of all types. Objections to its use on the scalp are that it may stain light hair, and the odor is objectionable to some people.

There is a German preparation, carboneol, which is very reliable in some cases. Crude coal tar, oil of cade, liquor carbonis detergens, and other tar preparations are very useful applications.

Dr. F. J. Eichenlaub, Washington, D. C.—Dr. Murrell did not mention in using neorobin the necessity for warning the patient of its irritating qualities. It may cause a serious dermatitis of the face, and if it gets into the eyes may cause a severe conjunctivitis.

Dr. C. O. King, Birmingham, Ala.—I would like to agree with Dr. McGavock in regard to the use of tar for seborrheic dermatitis of the scalp.

We have a preparation made by boiling down liquor carbonis detergens to a solid extract. This extract, from 2 to 5 per cent, is combined with 2 per cent precipitated sulphur and 2 per cent salicylic acid in a vegetable lard base, and applied to the scalp for two successive nights. The scalp is then washed with a good tar soap. This treatment should be repeated each week. I have obtained good results by this method.

TREATMENT OF ECZEMA IN INFANTS*†

By HARRY M. ROBINSON, M.D.,
Baltimore, Md.

The problem of the treatment of eczema and allied toxic dermatoses in infants, has always been a trying one. Numerous mechanical restraining measures[1] and local anti-pruritic and stimulating applications[2] have been used with varying degrees of success, but rarely with complete, so-called, permanent cure. Usually poor results are encountered (MacKenna[3]) (Sutton[4]) from purely local treatment, and relapses are frequent. The fundamental rule regarding the treatment of most conditions and certainly of eczema is to detect the cause or causes, and remove them. Rarely does any amount of external application cure match-box dermatitis[5] or dermatitis from buckwheat ingestion[5a] until the cause is discovered, and contact prevented. Unfortunately, the problem of infant eczema is somewhat more complicated.

The majority of infants with eczema are not breast fed, but receive modified cow's milk, and the eczema usually appears after the institution of a diet of cow's milk. C. J. White,[6] following the work of Towle and Talbot[7] on the examination of fecal matter in infant eczema, came to the conclusion that when fats and starches were not present in the feces the sensitization factor was either milk or egg; and Blackfan[8] found by cutaneous and intra-cutaneous tests in twenty-two children out of twenty-seven with eczema, that all were sensitized to one or more proteins, and most of them to cow's milk. Only two were sensitive to breast milk. It has been reported[9] that in certain patients breast milk is notably deficient in fats. Codliver oil is used to supplement it. Baker,[10] doing sensitization tests on seventy-six infants, found four positive and one doubtful reaction to casein and lactalbumin. Hazen[11] observed that the causes of eczema in infants were often milk and egg sensitization. Ormsby[12] claims that the most frequent allergins in infants are cow's milk and eggs.

With Pusey[13] and others I was early impressed with the fact that most of the children brought to the clinic or office suffering with eczema were receiving only cow's milk as a substitute for

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†From the Department of Dermatology, University of Maryland.

breast feedings. In a few of these, juggling such adjuncts as milk sugar or excess fats brought relief, but there were children with eczema who did not improve by this treatment, nor even if dried milk products were substituted. Once milk is proved to be the cause of the eczema the work before us is to eliminate milk from the dietary entirely, and yet sustain the patient's health.

McCollum and Simmonds,[14] Mellanby[14a] and others have reported that codliver oil is superior to butter fat in preventing rickets and in inducing calcification of bones. Shipley[14b] found that 1 per cent codliver oil was superior to 20 per cent butter fat in inducing growth and well-being in animals. In 1916 McCollum, Simmonds, and Pilz induced in rats normal growth and reproduction on a monotonous diet of maize 50 per cent, dry alfalfa leaves 30 per cent, and cooked or dried peas 20 per cent,[14c] so that, apparently, certain combinations of vegetables and grains are sufficient to nurture young animals. Since several mothers were not willing to have their infants endure the eczema until the condition was outgrown, or until they were older, I decided to attempt feeding these children with a milk-free diet of vegetables and cereals fortified by codliver oil.

By history, primarily, supplemented by the cutaneous tests, I determined whether the child was sensitive to milk or to external irritants. I found that sensitization tests were not always reliable. Our findings agreed with Cauper (quoted by Ormsby[12]) that a positive cutaneous test did not always indicate the cause of infantile eczema. For those children who received other food than milk, skin tests were used. In only one of those who received milk alone was a skin test done, and that was positive to milk. As a rule, a diet diary, giving in detail the feedings of the child, was requested. In all cases external factors such as soaps, talcum powders, and clothes were investigated before they were passed by as negative factors. This paper is based upon results of treatment of one case of urticaria pigmentosum and ten cases of eczema.

MILK-FREE DIET

About four years ago, at the instance of a very urgent parent, we decided to attempt a diet without milk. Another physician had informed the child's mother that cow's milk was the cause of the eczema, but that since the child was only eight months old nothing could be done about it. Various artificial milk products were substituted, such as condensed milk, Dryco, and Mellin's Food, without beneficial effect. I informed the mother of the procedure about to be attempted, and enlisted her cooperation. As I had often seen children from six to ten months of age at the dinner table eating and apparently tolerating bread, broth, peas, tomatoes and other foods, we[15] decided to try a mixed diet upon the child, with codliver oil as an adjunct. Within the first year we had formulated a diet list which appeared to be easily digested and tolerated. By fecal examination, and the noting of relapses, individual articles of sensitization were eliminated. Following is our routine diet list:

Lamb and beef broth cooked with barley or rice. Broth to be thickened with flour, and croutons used always.

Cereals: Corn meal, Quaker oats, cream of wheat or farina, rice, barley, hominy. All cereals to be cooked three hours and put through sieve.

Vegetable purees: Tomatoes, spinach, carrots, peas, lima beans (fresh or dried).

Grain: Potatoes (white or sweet, baked or mashed); string beans, macaroni (put through sieve), spaghetti, soy bean flour, wheat bread, crackers (not sweet). And coddled white of egg.

After the age of eight months children are given shredded or ground meats: beef, lamb or chicken.

The following three articles are mentioned primarily to condemn because almost all children have reacted against these: orange juice, prune juice, apple sauce.

Codliver oil, 0.5 dram, three times a day, to be increased slowly. The age of the child determines the quantity of feeding.

Tomato juice and puree of spinach were often irritating, although in one case, after two exacerbations following the reinserting of spinach into the dietary, a third trial several months later brought no reaction. We found it necessary to use soy bean flour with extreme care, although for the majority of the patients it was useful in correcting constipation.

RESULTS

In four of the cases the results were immediate, with partial or complete disappearance of the lesions. In two of the cases prompt gain in weight was noted. Two of the patients found difficulty in adjusting themselves to the diet and for the first three weeks showed consistent loss of weight, but improvement in the eczema. Later they began to gain weight. Four mothers found the regime too trying and gave up the diet. Of the last two patients treated in the University Hospital one lost weight consistently for ten days, but with improvement in the lesions. In the other case improvement was marked with stationary weight, but an intercurrent positive diphtheritic culture of the throat compelled the removal of the child to the Sydenham Hospital.

An account of two of the eleven cases follows:

Case 1.—A. B., a white girl three years old, had urticaria pigmentosum. As the mother was a graduate

nurse, and wished to continue her work, the patient was put on a modified cow's milk diet when four weeks old. Very soon after institution of this milk diet the mother noticed hives, which on disappearing left a brownish stain. This had continued to the time of examination, and was seen on the face, trunk and extremities.

There were numerous macular, pigmented spots of a light brownish color, irregular in shape and varying in size from a diameter of 1 to 3 or 4 mm. There was no infiltration. The mother said that all the lesions appeared first as wheals. There was one small, slightly raised, pinkish wheal on the abdomen at the time.

A skin test for milk was positive. The child was put on a milk-free diet on June 16, 1927.

Telephone communication two weeks later informed me that no new wheals had appeared. November 10 I was informed by telephone that there had been no more wheals and the brownish spots were lightening in color.

August 15, 1928, the child was brought in for examination. There were no wheals. The mother said there had been none since the institution of the milk-free diet, and she had noticed that mosquito bite wheals which had appeared recently did not leave brownish stains. Many of the older stains were noticeably lighter in color. The child was gaining weight on the milk-free diet.

Case 2.—R. C. D., a white boy, age three months, had eczema crustosum.

The infant was first seen when about one month old (November 15, 1925). He had been losing weight, and the mother claimed that she had not had enough milk to satisfy him. A physician at one of the milk stations had prescribed a modified cow's milk diet, alternating with breast milk. Two weeks later the child began to scratch, and soon afterward lesions of an eczematous type appeared.

There were on his body a large number of confluent infiltrated patches, one on the face being continuous over the forehead, cheeks and chin. They were bright pink with a moderate amount of scaliness and crusting. On the trunk and extremities there was some exudation of serum with very little scaling.

Calamine lotion, various anti-pruritic ointments, including crude coal tar-zinc oxid ointment, salicylic acid ointment with and without sulphur, aristol ointment, and boric ointment were tried without favorable results. The skin lesions became gradually larger, involving the face and forehead, and slowly extending to the rest of the body. Soap and water and talcs were eliminated as irritating factors. The possibility of silk or wool sensitization was next considered. Skin tests performed when the child was two and one-half months old were positive for milk. No other skin tests were made.

As the child was receiving only breast and cow's milk, the first procedure was to eliminate sugars from the modified milk; then the fats were removed as much as possible, without apparent benefit. The child was then taken off cow's milk and limited to breast milk. Itching lesions still continued to appear. He was then given successively Mellin's Food, Dryco, Dextrose, and malted milk in conjunction with prepared barley instead of milk. Then all forms of artificial milk were stopped, the baby receiving only breast milk feedings and water in the interim. As the lesions had shown no signs of improvement, and new lesions appeared constantly, it was decided that all milk, including breast milk, should be prohibited, and the diet described above was given with codliver oil one teaspoonful three times a day.

January 1, 1926, at the beginning of the replacement diet the baby was three months old. He weighed fourteen pounds.

January 15 there were definite signs of improvement in the skin.

May 15, at the age of four months, he weighed sixteen pounds. The amount of food was gradually increased. Lesions were present only on the face with slight roughness on the arms. Baked apple was added to the diet. September 15, at the age of eight months, he weighed nineteen pounds.

To the regular milk-free dietary about one tablespoonful a day of boiled chopped beef, veal or chicken (fat-free) was added. Soy bean mush was stopped because it was believed to be irritating.

February 15, 1927, at the age of thirteen months, he had six teeth, and weighed twenty-two pounds.

Lesions were still present, but only on the cheeks. A special investigation was made to find out wherein milk or milk products were being given. The only possibility seen was bread, and the mother was instructed to prepare bread free of milk or butter.

In April, at the age of fifteen months, the lesions had entirely disappeared. The weight was twenty-six pounds.

August 3, 1928, the weight was twenty-four pounds. The patient had continued to thrive and had all his teeth. He had had two or three attacks of croupy cough. The child was very strong muscularly. He was sent to Dr. H. E. Ashbury for x-ray of chest. His report is submitted: "The periphery of the lungs is relatively clear. The diaphragm outline is normal. The cardiovascular area is normal. There is no evidence of thymus enlargement. There is no evidence of rickets."

This child has been on a milk-free diet since the age of three months, and from clinical and x-ray findings is apparently normal.

These patients have required constant observation with weekly inspection of the diet diary to note exacerbations and possible causes of the eczema. The most discouraging factor has been the lack of gain in weight, and the consequent worry on the part of the parents. Two cases, mentioned above but not reported in this paper, as they are at present under treatment at the University Hospital, have shown consistently good results, but loss in weight. One of them was very puny. When the milk-free diet was increased in quantity there was a consistent gain in weight but a slight recurrence of lesions.

CONCLUSIONS

(1) Diagnosis of milk as the cause of dermatoses has been made by history and skin tests.

(2) Constantly good results have been obtained in the majority of our cases by a milk-free replacement diet, but it has often been necessary to hospitalize our patients, as the mothers did not feel competent to enforce the diet.

(3) Codliver oil has been our mainstay, and

has been well tolerated in summer, as well as in winter. Whenever diarrhea occurred the dose of codliver oil was diminished.

(4) It was noted in one patient that milk irritation was due to the amount of milk in baker's bread.

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15. I am indebted to Mrs. M. V. Robinson, R. N., for valuable help in arranging the dietary.

THE NEWER KNOWLEDGE OF HEART DISEASE*†

III. THE INTERPRETATION OF CARDIAC PAIN

By TINSLEY RANDOLPH HARRISON, M.D.,
Nashville, Tenn.

A man in the sixtieth year of his life began to feel while he was walking an uneasy sensation in his left arm. . . . . After it had continued ten years it would come upon him two or three times a week, at night while he was in bed, and then he was obliged to sit up for an hour or two before it would abate so much as to suffer him to lie down. . . . . He died suddenly without a groan at the age of seventy-five.—*William Heberden.*

The fact remains that out of the confused melee of clinical conditions to which the term "angina pectoris" has been applied, one condition stands forth, clearly marked from the others. It is the one that corresponds to Heberden's original description, and its import is unmistakable; the patient with this condition is doomed. . . . . The angina pectoris of Heberden has but one cause, anoxemia of the myocardium.—*Keefer and Resnik.*

The cardinal symptoms of heart disease are dyspnea, edema and pain. It is with the last of these that this paper is concerned. The most important cause of cardiac pain will be considered first.

Angina pectoris, which was described and named by Heberden,[1] has been a veritable apple of discord. The hypothesis of coronary sclerosis, of which Edward Jenner[2] was an early sponsor, was often supported by the results of autopsies and was accepted through most of the Nineteenth Century by many clinicians. Huchard[3] was an able advocate of this view. However, Sir Clifford Albutt[4] pointed out that a certain number of persons who, during life, had typical angina pectoris, were found at autopsy to have normal coronary arteries. These individuals usually had disease of the root of the aorta, and Albutt believed that this organ and not the heart was the seat of the pain. His views were accepted by many prominent clinicians; others adhered to the coronary hypothesis, and these proposed "coronary spasm" as the cause of the pain in the patients who had normal coronary arteries. Sir James Mackenzie[5] taught that the pain arose from myocardial exhaustion, but this concept did not aid in clarifying the subject. Some clinicians adopted a compromise view, attributing the pain to aortic disease, but believing that the prognosis depended on the condition of the coronary vessels.

Within the past year Keefer and Resnik[6] have published a theory which seems to clarify the whole subject. After careful analysis of the reported autopsied cases, as well as several of their own, they showed that those patients who during life had had typical angina pectoris practically always presented at autopsy one or more of three lesions: (a) sclerosis of the coronary vessels, (b) occlusion of the mouth of one of the coronary arteries, (c) insufficiency of the aortic valves. The authors then reviewed a number of experimental studies which agreed in indicating that the flow of blood through the coronary arteries was dependent on the diastolic blood pressure. (It is obvious that the flow of blood through the left coronary artery must cease during systole, because the pressure in the heart wall is greater than in the aorta during the period

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when blood is being expelled.) It was concluded that in aortic insufficiency, a condition known to be associated with a low diastolic blood pressure, the coronary flow was diminished and direct experimental evidence for this proposition was quoted. Therefore, it was demonstrated that all patients with angina have one fundamental disturbance in common, a failure of the oxygen supply to keep pace with the oxygen demand of the heart.

It is well known that deficiency of oxygen in a muscle causes local accumulation of lactic acid. This substance causes spasm of muscles when its amount becomes excessive. The pain of intermittent claudication, the soreness of the "Charlie-horse," and the spasm of rigor mortis are examples of the effects of lactic acid on muscles. The work of Keefer and Resnik seems definitely to remove angina pectoris from the realm of mystery and to place it in this group of known physiological disturbances.

Keefer and Resnik emphasized another fact, which was familiar to Heberden (*vide supra*), but which has often been forgotten by subsequent writers. Sudden death is not only an occasional complication of the disease, but its likelihood is a cardinal feature. The same disturbance (oxygen lack) which produces the pain may cause fibrillary contraction of the ventricles with its inevitable consequence, death. Once an individual develops true angina pectoris the Damoclean sword forever afterwards hangs over his head. He may live ten, fifteen, or (rarely) twenty years; the pain may even disappear entirely, but the possibility (in most cases the probability) of sudden death remains. Unless the physician feels that such a grave outlook is justified in a given patient he should not consider him as suffering from the disease.

Such a concept naturally leads to the question of diagnosis. The most important point in this connection is the recognition that there is no intermediate state. Patients either have angina pectoris or they do not have it. Here, as in other diseases, an absolute diagnosis may be impossible, but there is no more justification for calling a pain "anginoid" than there is for designating unexplained abdominal pain as "ulceroid," or chronic severe headache of unknown cause as "neoplastoid." "Anginoid," "secondary angina," "pseudo-angina," "reflex angina"—these are all confusing and meaningless terms, and should be discarded from medical literature.

The following group includes those conditions which are most likely to be confused with angina pectoris. Those conditions which most frequently simulate it are listed first.

(1) Cardiac neurosis.
(2) Coronary occlusion.
(3) Uncomplicated syphilitic aortitis.
(4) Aortic aneurysm.
(5) Pectoral neuralgia and myalgia.
(6) Arthritis of the spine.
(7) Pericarditis and pleurisy.
(8) Disease of the left shoulder joint.

As the last four of these conditions rarely cause serious difficulty in diagnosis they will not be discussed.

The differentiation of angina pectoris from the pain of cardiac neurosis was discussed at length by Mackenzie in his "Angina Pectoris," and was well summarized in his "Diseases of the Heart." The most important differential points are:

(a) *Sex.*—Cardiac neurosis is much more common in females; the reverse is true of angina pectoris.

(b) *Age.*—Cardiac neurosis is most common in young individuals. When it is present in an elderly subject the symptoms usually will be found to have begun before thirty. The heart is normal on physical examination. Angina pectoris is rare before the age of forty-five. When a person under twenty has angina pectoris he nearly always has (1) rheumatic heart disease with aortic insufficiency. During the third and fourth decades angina pectoris is seen either under the condition which was just mentioned or (2) in individuals who have syphilitic aortitis complicated either by aortic insufficiency, stenosis of a coronary orifice, or both. Patients who between forty and sixty years of age develop angina pectoris usually have one of these two conditions, or much more commonly (3) hypertension (with arteriosclerosis). Individuals over sixty often have angina without any of the three causative factors which have been mentioned, but with (4) arteriosclerosis (the "decresent" type, which is not associated with hypertension). During the attack the blood pressure may be elevated in any of the patients; those who have cardiac neurosis, as well as those who have angina.

(c) *Cardiac Enlargement.*—This is never observed in uncomplicated cardiac neurosis. It is present in the vast majority of patients who when less than sixty develop angina pectoris. After this age many sufferers from this disease

have no cardiac enlargement, but at this period of life cardiac neurosis is unusual.

(d) *Palpitation.*—During the attack this symptom is more common in cardiac neurosis than in angina pectoris.

(e) *Character and Location of the Pain.*—In cardiac neurosis the pain is more likely to be darting and in the precordial region. In angina pectoris the pain is most often described as spasmodic. It may be localized to the precordium, but more commonly is substernal and radiates to the left arm. Occasionally the pain is felt only in this arm and rarely it may be confined to the left shoulder, the right shoulder, the abdomen, the neck, the jaw or the lower tip of the ear.

(f) *Angor Animi.*—The fear of death is felt most by those suffering from angina, but it may be talked about most by those with cardiac neurosis.

(g) *General Demeanor During the Attack.*—The patient with cardiac neurosis often thrashes about in bed. She may say, "I'm dying," often cries out continually, and usually takes care that some one hears her. The facial muscles may portray extreme fear but are mobile, and the expression changes from moment to moment. Not infrequently in severe cases she weeps and repeatedly strikes the precordium. During the attack of angina pectoris the subject usually is almost motionless. The muscles, including those of the face, become rigid. The expression indicates real agony and remains fixed until the pain diminishes. The hands are clinched on the precordium. Cold sweat stands out on the face. A tear may be seen in the eye, but profuse weeping rarely if ever occurs. His whole behavior indicates that he feels, and is, near the threshold of the portals of death.*

(h) *Precipitating Factors.*—An emotional upset is a common cause of the pain of cardiac neurosis. The attack usually comes, not immediately following the unpleasantness, but after the patient has had a little time to brood and worry over it. The pain often appears at night after going to bed but before going to sleep. In general, the symptom is more marked during rest than during activity. Gastric distension may bring on the pain which in such cases is relieved by soda. The attacks may come more frequently when the patient is constipated. In early and milder cases of angina pectoris the pain is brought on by the three "e's:" exercise, eating and excitement. Walking up a hill after a heavy meal is especially liable to bring on the pain, as was emphasized by Heberden and by Mackenzie. Later in the disease the slightest exertion causes pain, which may also be precipitated by cold baths or cold winds. Nocturnal angina is common and occurs especially after the patient has been asleep for a time. The attack may also come on first getting into bed if the sheets are cold.

(i) *Constitutional Type.*—In cardiac, as in other forms of neurosis, the subject is usually rather spare of build. In addition to the cardiac symptoms there are usually complaints referable to several parts of the body, particularly the gastro-intestinal organs. The patient always complains of nervousness. Angina pectoris is most common in strong muscular individuals who have been unusually healthy. Frequently they are a little overweight. Ordinarily there are no other symptoms.

(j) *The Therapeutic Test.*—Sodium bromid is of little or no value in angina pectoris, but may give much relief to the patients with cardiac neurosis. Nitroglycerine is almost specific for the former, but often makes the latter worse.

Finally, one must remember that a patient may have both diseases. Such cases are, fortunately, rare.

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when blood is being expelled.) It was concluded that in aortic insufficiency, a condition known to be associated with a low diastolic blood pressure, the coronary flow was diminished and direct experimental evidence for this proposition was quoted. Therefore, it was demonstrated that all patients with angina have one fundamental disturbance in common, a failure of the oxygen supply to keep pace with the oxygen demand of the heart.

It is well known that deficiency of oxygen in a muscle causes local accumulation of lactic acid. This substance causes spasm of muscles when its amount becomes excessive. The pain of intermittent claudication, the soreness of the "Charlie-horse," and the spasm of rigor mortis are examples of the effects of lactic acid on muscles. The work of Keefer and Resnik seems definitely to remove angina pectoris from the realm of mystery and to place it in this group of known physiological disturbances.

Keefer and Resnik emphasized another fact, which was familiar to Heberden (*vide supra*), but which has often been forgotten by subsequent writers. Sudden death is not only an occasional complication of the disease, but its likelihood is a cardinal feature. The same disturbance (oxygen lack) which produces the pain may cause fibrillary contraction of the ventricles with its inevitable consequence, death. Once an individual develops true angina pectoris the Damoclean sword forever afterwards hangs over his head. He may live ten, fifteen, or (rarely) twenty years; the pain may even disappear entirely, but the possibility (in most cases the probability) of sudden death remains. Unless the physician feels that such a grave outlook is justified in a given patient he should not consider him as suffering from the disease.

Such a concept naturally leads to the question of diagnosis. The most important point in this connection is the recognition that there is no intermediate state. Patients either have angina pectoris or they do not have it. Here, as in other diseases, an absolute diagnosis may be impossible, but there is no more justification for calling a pain "anginoid" than there is for designating unexplained abdominal pain as "ulceroid," or chronic severe headache of unknown cause as "neoplastoid." "Anginoid," "secondary angina," "pseudo-angina," "reflex angina"—these are all confusing and meaningless terms, and should be discarded from medical literature.

The following group includes those conditions which are most likely to be confused with angina pectoris. Those conditions which most frequently simulate it are listed first.

(1) Cardiac neurosis.
(2) Coronary occlusion.
(3) Uncomplicated syphilitic aortitis.
(4) Aortic aneurysm.
(5) Pectoral neuralgia and myalgia.
(6) Arthritis of the spine.
(7) Pericarditis and pleurisy.
(8) Disease of the left shoulder joint.

As the last four of these conditions rarely cause serious difficulty in diagnosis they will not be discussed.

The differentiation of angina pectoris from the pain of cardiac neurosis was discussed at length by Mackenzie in his "Angina Pectoris," and was well summarized in his "Diseases of the Heart." The most important differential points are:

(a) *Sex.*—Cardiac neurosis is much more common in females; the reverse is true of angina pectoris.

(b) *Age.*—Cardiac neurosis is most common in young individuals. When it is present in an elderly subject the symptoms usually will be found to have begun before thirty. The heart is normal on physical examination. Angina pectoris is rare before the age of forty-five. When a person under twenty has angina pectoris he nearly always has (1) rheumatic heart disease with aortic insufficiency. During the third and fourth decades angina pectoris is seen either under the condition which was just mentioned or (2) in individuals who have syphilitic aortitis complicated either by aortic insufficiency, stenosis of a coronary orifice, or both. Patients who between forty and sixty years of age develop angina pectoris usually have one of these two conditions, or much more commonly (3) hypertension (with arteriosclerosis). Individuals over sixty often have angina without any of the three causative factors which have been mentioned, but with (4) arteriosclerosis (the "decresent" type, which is not associated with hypertension). During the attack the blood pressure may be elevated in any of the patients; those who have cardiac neurosis, as well as those who have angina.

(c) *Cardiac Enlargement.*—This is never observed in uncomplicated cardiac neurosis. It is present in the vast majority of patients who when less than sixty develop angina pectoris. After this age many sufferers from this disease

have no cardiac enlargement, but at this period of life cardiac neurosis is unusual.

(d) *Palpitation.*—During the attack this symptom is more common in cardiac neurosis than in angina pectoris.

(e) *Character and Location of the Pain.*—In cardiac neurosis the pain is more likely to be darting and in the precordial region. In angina pectoris the pain is most often described as spasmodic. It may be localized to the precordium, but more commonly is substernal and radiates to the left arm. Occasionally the pain is felt only in this arm and rarely it may be confined to the left shoulder, the right shoulder, the abdomen, the neck, the jaw or the lower tip of the ear.

(f) *Angor Animi.*—The fear of death is felt most by those suffering from angina, but it may be talked about most by those with cardiac neurosis.

(g) *General Demeanor During the Attack.*—The patient with cardiac neurosis often thrashes about in bed. She may say, "I'm dying," often cries out continually, and usually takes care that some one hears her. The facial muscles may portray extreme fear but are mobile, and the expression changes from moment to moment. Not infrequently in severe cases she weeps and repeatedly strikes the precordium. During the attack of angina pectoris the subject usually is almost motionless. The muscles, including those of the face, become rigid. The expression indicates real agony and remains fixed until the pain diminishes. The hands are clinched on the precordium. Cold sweat stands out on the face. A tear may be seen in the eye, but profuse weeping rarely if ever occurs. His whole behavior indicates that he feels, and is, near the threshold of the portals of death.*

(h) *Precipitating Factors.*—An emotional upset is a common cause of the pain of cardiac neurosis. The attack usually comes, not immediately following the unpleasantness, but after the patient has had a little time to brood and worry over it. The pain often appears at night after going to bed but before going to sleep. In general, the symptom is more marked during rest than during activity. Gastric distension may bring on the pain which in such cases is relieved by soda. The attacks may come more frequently when the patient is constipated. In early and milder cases of angina pectoris the pain is brought on by the three "e's:" exercise, eating and excitement. Walking up a hill after a heavy meal is especially liable to bring on the pain, as was emphasized by Heberden and by Mackenzie. Later in the disease the slightest exertion causes pain, which may also be precipitated by cold baths or cold winds. Nocturnal angina is common and occurs especially after the patient has been asleep for a time. The attack may also come on first getting into bed if the sheets are cold.

(i) *Constitutional Type.*—In cardiac, as in other forms of neurosis, the subject is usually rather spare of build. In addition to the cardiac symptoms there are usually complaints referable to several parts of the body, particularly the gastro-intestinal organs. The patient always complains of nervousness. Angina pectoris is most common in strong muscular individuals who have been unusually healthy. Frequently they are a little overweight. Ordinarily there are no other symptoms.

(j) *The Therapeutic Test.*—Sodium bromid is of little or no value in angina pectoris, but may give much relief to the patients with cardiac neurosis. Nitroglycerine is almost specific for the former, but often makes the latter worse.

Finally, one must remember that a patient may have both diseases. Such cases are, fortunately, rare.

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due to sudden congestion of the liver, is frequent. For this reason coronary occlusion often simulates acute intra-abdominal inflammation, and because of diagnostic mistakes these patients are very frequently subjected to operation for a supposedly perforated peptic ulcer, or suspected acute cholecystitis. It may be stated as a general rule that when a person over sixty years of age develops an acute and extremely severe epigastric pain the burden of proof is on the physician, who says it is not coronary disease.

(2) Nausea and vomiting occur in a large proportion of the cases and this adds to the diagnostic difficulty.

(3) The objective circulatory phenomena are those of two different types of failure: (a) collapse, with tachycardia, diminution in blood pressure, and marked general weakness. Syncope is common. (b) Congestive failure, with rales in the lungs, enlargement of the liver, and, in some cases anasarca, dyspnea and cardiac irregularities.

(4) Fever and leucocytosis (these are due to myocardial necrosis).

(5) Emboli in distant organs. These result from detachment of mural thrombi in the left ventricle. The spleen is a very common site and embolism of this organ causes perisplenitis and thereby adds still another type of pain, thus creating further difficulty in diagnosis.

The differentiation of coronary occlusion from angina pectoris rests almost entirely on the duration of the attack. In the former condition the pain lasts for hours or days; in the latter, for seconds or minutes. Nitroglycerine relieves the pain of angina pectoris; morphin is necessary in coronary occlusion. The symptoms and signs of circulatory collapse are the most valuable points in differentiating coronary occlusion from pneumonia, acute peritonitis and the mythical "acute indigestion." The most important point about the disease is to remember that it occurs, and frequently.

Uncomplicated aortic syphilis is often a painless disease. When pain is present it is never so violent as in severe cases of angina pectoris. Ordinarily the sensation is more that of a feeling of vague discomfort or ache under the sternum, in the left interscapular region, or occasionally in the left shoulder. There may be a choking feeling. The patient often complains of a "lump." The discomfort lasts for hours and, like other syphilitic pains, is worse at night. There is no characteristic relation to exertion and paroxysms are exceptional. The Wassermann reaction is positive in about two-thirds of the cases. The aorta is often dilated. When the dilatation affects the ascending portion it can often be detected by percussion, but when the transverse or descending parts are involved the x-ray is the only reliable guide. In an individual less than fifty years old with a normal blood pressure the diameter of the teleroentgenographic supracardiac vascular shadow is usually less than six centimeters. If, in such a patient this shadow is more than 7 cm. wide, aortic syphilis is very probable.

When the syphilitic process involves the coronary orifices or spreading to the aortic valves causes insufficiency, the patient often develops true angina pectoris, in addition to the less severe pain of "simple" aortitis. Aneurysm, another complication of luetic aortitis, often causes no pain. When, however, the sac pushes forward and erodes the sternum, or ribs, or advances backward and erodes the vertebrae severe pain occurs. This pain is constant, throbbing or "boring," often "shooting" if the intercostal nerves are involved. The pain does not have the characteristic cramp-like character of angina pectoris, is not particularly related to exertion and is rarely paroxysmal. Patients with aneurysm may have angina pectoris, when the coronary orifices or aortic arches are involved, but the former does not *per se* cause the latter.

In the treatment of cardiac pain the first and most important measure is correct diagnosis. Patients with cardiac neurosis must be encouraged to "do things;" individuals with angina pectoris must be restrained. Although the treatment of aneurysmal pain is a relatively hopeless proposition, the same is by no means true of uncomplicated syphilitic aortitis. Here a few weeks of iodin alone, then a few more weeks of mercury or bismuth, followed by the cautious administration of small but increasing doses of arsenicals may not only stop the pain but (presumably) prevent the development of the fearful complications (the three "a's:" aneurysm, aortic insufficiency and angina pectoris).

When on the basis of aortic syphilis, angina pectoris has developed it is usually unwise to gives arsenicals, but iodids, mercury and bismuth are sometimes of value. In the more common, non-syphilitic angina pectoris the value of restricted activity and nitroglycerine are too well recognized to require comment. In such cases beneficial results sometimes follow the administration of diuretin or of euphyllin. Musser[11] and Smith[12] have emphasized the value of the

latter drug. One gains the impression that potassium iodid is of value, but proof is lacking.

In recent years the surgical treatment of angina pectoris has enjoyed an increasing vogue. First employed by Jonnesco,[13] encouraging results have been reported by several authors.[14] Sir James Mackenzie attacked this form of therapy. In regard to the operative treatment of angina pectoris, he said:

"Hitherto, medicine has been made the object of ridicule and satire on the ground that remedies whose action is unknown have been given for conditions of which the doctor is ignorant. Fortunately, such remedies usually do not harm, even when they do no good, but when it comes to a surgical operation where structures essential to health, and it may be to life, are irreparably damaged, it is necessary to draw attention to a course of action which is, to say the least, a step backward."[15]

It would appear, therefore, that there are two sides to this question. One must realize that pain is a protective mechanism, as its occurrence may prevent the individual from undertaking an amount of exertion which might prove fatal. For this reason it would seem to be unwise to attempt surgical treatment in those patients whose pain comes only on exertion. More conservative methods of treatment seem preferable here. However, when a patient has frequent attacks of pain at rest it may be humane to relieve his suffering, if possible, even at the risk of shortening his life. The author has followed only three patients in whom the cervical sympathetics were removed. One of them did not seem to be helped, but in the other two patients relief of pain was striking and immediate. One of these died suddenly several months later. The other, who had been bed-ridden because of pain for several months before operation, is living and able to walk six weeks after the operation. Even if he dies within the next few days, the writer will still think that the operation was justified. He will, at least, have had his misery replaced by comfort for a little while.

This discussion of cardiac pain has been necessarily incomplete. The important subject of pericarditis has scarcely been mentioned. Attention has been focused on that common and fearsome malady, angina pectoris, and the disorders with which it is most likely to be confused. An attempt has been made to emphasize the fact that diagnosis is the first and most important step in the treatment of cardiac pain.

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DR. M. Y. DABNEY, Editor
C. P. LORANZ, Secretary-Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Twenty-Third Annual Meeting
Miami, Florida, November 20-22, 1929
Pre-Meeting Clinics, November 19, 1929

MIAMI, NOVEMBER 19-22

The programs for the general, clinical and section meetings of the twenty-third meeting of the Southern Medical Association are being rapidly completed. They will stress the things which every physician needs to know every day, the small things and large things which help reduce the duration and intensity of illness. Tuesday, November 19, will be an unofficial day, a pre-meeting clinical day, with a splendid program by members of the Miami profession. On Wednesday, November 20, the general clinical program will begin, and the address of the President, Dr. Thomas W. Moore, of Huntington, West Virginia, will be heard that evening.

On Thursday and Friday, November 21 and 22, the sections will meet in half-day sessions. The programs contain the names of leaders in their various lines of work, not only from the Southern and Northern United States, but from Canada and Cuba. The American Society of Tropical Medicine is meeting this year conjointly with the Southern Medical Association. Florida should furnish clinical material particularly suitable for study by this Society. The Southern Association of Anesthetists meets, as usual, conjointly with the Southern Medical Association, and the Atlantic Coast Line Surgeons' Association will merge its annual meeting into the Section on Railway Surgery of the Southern Medical Association.

PRESIDENTS' NIGHT

Wednesday evening will be "Presidents' Night," when the presidents of three medical organizations will be heard: the President of the Southern Medical Association, Dr. Moore; the President-Elect of the American Medical Association, Dr. William Gerry Morgan, of Washington, D. C.; and the President of the Circulo Medico de Cuba and Secretary of Sanitation of the Republic of Cuba, Dr. Francisco M. Fernandez. Dr. Fernandez is a member of the cabinet of the President of Cuba, and is head of all public health work in the Island of Cuba, where splendid work is being done under his direction. The Association is greatly honored by having him attend the Miami meeting and deliver this address.

There will be a public address Tuesday evening, and the Orations on Medicine and Surgery will be given on Thursday evening.

SOCIAL FEATURES

Special entertainment such as only Miami can furnish is being arranged for the visiting physicians and ladies. The President's reception and grand ball will be at the Coral Gables Country Club, one of the most beautiful country clubs in the world, on Wednesday evening immediately after the general session. There will be dancing in the lovely outdoor pavillion. Another unique and delightful entertainment, a beach party at Miami Beach, will be given on Tuesday afternoon and early evening. The alumni reunions will be in the form of smokers on Thursday evening following the general session.

SPORTS

The golf tournaments for men, with handicap and without handicap, will be played at the Miami Country Club, with no greens fee and at the convenience of the players up to Thursday noon. The ladies tournament will be played at the Miami Beach Municipal Golf Course, with no greens fee, Thursday forenoon. Other golf courses open are the Coral Gables Golf and Country Club, Country Club Estates Course, and the Miami Biltmore Club with small greens fees. In addition to the two permanent trophies of the tournament, the *Washington Post* and the *Dallas Morning News* Cups, the Local Committee will offer four prizes for the men and four for the ladies. There will be the usual trap shooting tournament, the time and place not yet determined.

Miami is a fisherman's paradise, and the best game fishing available to Americans is off its coast. The balmy weather of November will permit surf bathing and all forms of water sports. There is also good hunting in the vicinity.

TRAVELING ARRANGEMENTS

Through sleepers with reduced railroad rates are available from all points in the South to Miami. A special train, the "President's Special," has been announced. Details may be found on page 34. Florida's splendid hard-surfaced roads make a trip by automobile easy, and Florida can be seen at its best by automobile. A tour from New Orleans to Miami is being arranged, which will go by steamer from New Orleans to Tampa, and from Tampa to Miami by bus. The Medical Association of Georgia, of which Dr. William R. Dancy, of Savannah, is President, is featuring a "President's Tour," a motorcade from Savannah to Miami, and physicians from other states are invited to join it.

Those who motor will see the most beautiful parts of Florida. They should make every effort to go through the Ridge Section, and to see the Bok Memorial Tower and Sanctuary at Lake Wales, in the heart of the ridge section. The Bok Tower, on the highest point in Florida, is worth driving many miles to see. It is especially lovely when its marvellous chimes are playing.

HOTELS

Miami is noted for its beautiful and commodious hotels. Five of the largest and finest are close together on Biscayne Boulevard, across from the city park, overlooking Biscayne Bay and the Atlantic Ocean. Guaranteed rates are $3.00 to $5.00 per day for single rooms and $5.00 to $8.00 for double rooms. See page 950 for detailed hotel information.

CUBA

"After Miami, Cuba." To climax an already delightful occasion the Association has arranged an official all-expense post-convention tour to Cuba under the direction of the Secretary-Manager. Few will again have this propitious opportunity to see Havana and Cuba at so low a cost under such delightful circumstances. Those who visit Cuba are invited by Dr. Fernandez, Secretary of Sanitation, to be his guests for a luncheon in Havana. See page 947 for full details and program of the tour.

Miami and Florida never lose their charm. "There is no place in the world that compares with Miami as a resort center", says a retired business man of Chicago.

The great interest of medicine lies in its ever changing character; the physician can never handle his cases perfectly, but he can each year estimate what his fellow practitioners have evolved, which will improve his own methods of practice.

RADIUM AND X-RAY IN PREGNANCY

Great confusion exists in the knowledge of the effect of radium and roentgen rays upon normal tissues. Tissue change is proportional to the amount of radiation administered and to the particular wave length, and experimenters have varied these factors. One of the first effects of a little x-ray is to stimulate the rate of division of growing cells, and thus to induce more rapid development. The fruit fly matures earlier than normally after radiation, and its life cycle is shortened. Larger quantities of x-ray are very destructive, and young dividing cells are particularly vulnerable.[1]

In higher animals the gonad cells are among the tissues most sensitive to the roentgen ray. For this reason the physician naturally hesitates to expose to x-radiation the pelvic organs of a woman in the child-bearing age. In certain conditions, however, such as carcinoma of the cervix or small fibroids of the uterus unassociated with inflammatory disease, some form of radiation is the approved therapeutic measure. Before it is employed, however, its possible influence upon future offspring of the patient should be carefully considered.

Therapeutic radiation during pregnancy usually results in abortion, and has been recommended as a very feasible means to this end. In the non-pregnant woman, temporary or permanent sterilization may be accomplished by radium or the x-ray, and permanent sterilization of the unfit by this means has been suggested. The dosage may be so measured as to produce sterility for only a few months or years. A number of obstetricians and gynecologists have reported that children born after a temporary period of roentgen sterilization are normal, and that radiation is no contraindication to

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future childbearing.[2] [3] From present knowledge, it may be undertaken without great scruple in young women if it is necessary. Defective babies, however, have frequently been reported to result from radiation during pregnancy. The unfertilized germ cell is not so liable to injury from the x-ray as is the growing embryo.

Murphy,[4] of the University of Pennsylvania, has studied the effects of radiation before and during pregnancy, by questionnaire to a number of physicians, and has reported an analysis of results in the cases of 625 women. His statistics confirm the reports that the children born after a period of roentgen ray sterility were regularly normal. They had no more defects than the average child, and it could not be said definitely that the radiation was harmful. But among pregnant women who went on to term after x-ray exposure, many bore unhealthy children. In the series, thirty-eight of these unhealthy children were reported, and among them was found a high frequency of lesions of the central nervous system. Seventeen had microcephaly, a rare condition which occurs usually at the rate of one in ten or twenty thousand births.

Murphy believes that this high incidence of microcephaly can not help having some significance. He reports one case in detail.[5] A woman was radiated for cervical carcinoma in the sixth month of pregnancy, and it was expected that she would abort. Instead, the defective baby was born the following month. Not enough radiation had been given to bring about the menopause, and the woman menstruated for eleven years afterward, yet the child was grossly abnormal. At the age of twelve years he had a head five centimeters smaller than the average. He could not talk, but was a low grade idiot or imbecile.

The integrity of the ovum, Murphy agrees with previous students of the question, is not impaired by the usual therapeutic dose of roentgen ray or radium; but any exposure is dangerous to the developing fetus. If therapeutic radiation is necessary during pregnancy, the pregnancy should always be terminated and before this agent is employed every care should be taken to rule out the possibility of the presence of an embryo in the uterus.

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BICHLORID OF MERCURY POISONING

In the case of certain quite complex medicaments, the test tube reaction is approximately similar to the reaction in the body. Typhoid antibody, or immune serum, in the test tube, will agglutinate typhoid antigen, or typhoid bacilli, supposedly as it does in the living host. The *in vivo* and *in vitro* results are closely comparable. It is not so with the inorganic and simple organic reagents which chemists sometimes recommend for treatment of disease. A beautiful test tube reaction will entirely fail to take place if the reacting substances are in the blood. It is a difficulty which has always confronted medical progress. Chemistry has been responsible for poor leads in treatment as well as for many medical advances.

Gout, it was once held, was caused by excess of uric acid deposits around the joints, and it was thought that if they could be dissolved and washed away, the disease might be cured. Lithium salts and lithium waters were given for treatment of gout because lithium carbonate in the test tube dissolves uric acid very nicely, forming the readily soluble urate. This it was expected would also happen in the body, after which the insoluble uric acid, having become the very soluble lithium urate, would easily be excreted by the kidneys. For some reason the lithium failed to hit the target at which it was aimed. It did not go where it was told; the gout was not benefited, and the treatment was abandoned many years ago.

If bacteria were as easily killed in the body as in the test tube, again therapeutics might profit. If the antiseptics, mercurochrome, gentian violet, acriflavine, which in low concentrations kill laboratory micro-organisms, killed them in the blood stream as quickly, infectious diseases would soon be exterminated. But *B. typhosus, tuberculosis, pertussis, diphtheriae,* and the organisms of undulant fevers, easily destroyed in culture, are not readily attacked in the body of the living host by the same agents. The antiseptics sent into the body to kill bacteria frequently fail to accomplish this end.

An alleged specific treatment which has come

down to the present day, is the use of sodium thiosulphate for mercury and lead poisoning. In the test tube, the soluble salts of these metals combine with the thiosulphate to give insoluble mercury or lead sulphid. If this occurred in the body, an injurious very soluble salt such as mercuric chlorid, would be precipitated and rendered unreactive; and belief in this desirable result has led many to use the thiosulphate. Successful treatment of mercuric chlorid poisoning by this means has been reported, and is a method approved by recent textbooks.[1] Experimental work throws doubt upon its value.

Melville and Bruger,[2] among others,[3] investigated the effect of sodium thiosulphate upon bichlorid poisoning in dogs. They ascertained the lethal dose of mercuric chlorid for dogs to be four milligrams per kilogram. This was neither higher nor lower if sodium thiosulphate was administered simultaneously with the mercuric chlorid, and the period of survival after poisoning was not increased. Clinically in life and pathologically at autopsy the treated and untreated dogs were the same. If any mercury at all were converted into insoluble sulphid, these authors say, the diuresis in life caused by the mercury should be diminished. But diuresis in treated and in untreated dogs was the same. Sodium thiosulphate when administered under the most advantageous circumstances had no effect whatever upon the course of the mercuric chlorid poisoning.

It may be reiterated, that all drugs should be extensively tried upon animals before they are introduced into medical practice. The overweaning desire of the physician to cure, which will not wait to prove the value of a method but catches at a straw of hope, is responsible for much futile therapy. The thiosulphate appears to do no harm, which may not be said of all the drugs which have been employed to combat disease. At present bichlorid poisoning may be treated by producing emesis, or by other attempts to remove it from the stomach, or perhaps by forcing fluids, if the patient is seen in time. After it has entered the tissues in quantity, nothing at presnet is known to help the patient.

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Cuba Tour

"AFTER MIAMI, CUBA"

"The loveliest land that human eyes have ever seen"
—Christopher Columbus, October, 1492.

Official Southern Medical Association All-Expense Post-Convention Tour to Cuba Under Direction of Mr. C. P. Loranz, Secretary-Manager.

A Five-Day Tour—$92.50

SATURDAY, NOVEMBER 23

Leave Miami Saturday, November 23, 3:00 a. m., sleepers open at 9:30 Friday night. Arrive at Key West Saturday at 7:40 a. m.

Brief sightseeing trip by auto around Key West if time permits and sufficient number of automobiles can be secured.

Aboard S. S. Northland of the Peninsular and Occidental Steamship Line. Ship sails at 8:30 a. m. Breakfast (by special arrangement) and lunch aboard ship.

Arrive in Havana Saturday, November 23, about 3:30 p. m.

The Sevilla-Biltmore Hotel, the best and best located hotel in Havana, is general headquarters and radiating center for the tour, and will be used exclusively to the capacity of the hotel. Should the Sevilla-Biltmore not be able to accommodate all on the tour, other good hotels in Havana will be used. The Transportation Department of the Sevilla-Biltmore Hotel, under the direction of Mr. Charles E. Seijo, will see that all on the tour and their baggage are promptly taken to the hotels after passing through customs. *It is recommended that only hand baggage be taken on the tour to Cuba.*

Remainder of afternoon free.

Dinner at hotel.

8:00 p. m., leave on sightseeing trip, seeing Havana by night, visiting Centro Asturiano and Centro Gallego Clubs, attending a Jai-Ali game (Spanish game—very interesting), driving through Vedado, Miramar, arriving at Chateau-Madrid or Sans-Souci about 11:30, where the elite of Havana gather to dine and dance. Leave about 12:30, visiting the Casino, "the Monte Carlo of the Western Hemisphere" (if open), and Montmatre Club, the best cabaret in Havana, arriving at hotel about 3:00 a. m. On this trip the best of the Havana night life is seen.

SUNDAY, NOVEMBER 24

Breakfast at hotel.

11:00 a. m., leave on sightseeing trip of downtown Havana by day, visiting points of historical interest, beautiful old churches and cathedrals, and crossing the bay at Luz Ferry to visit the quaint and historical Morro Castle and Cabanas Fortress, arriving at Triscornia, the Cuban Immigration Station, at about 1:30 for lunch as the guests of Dr. Francisco M. Fernandez, Secretary of

Sanitation, Republic of Cuba (a member of the President's Cabinet). After lunch return to Havana by the land route.

Evening free. No entertainment provided. Dinner not provided for on tour.

MONDAY, NOVEMBER 25

Breakfast in hotel. An early breakfast is suggested and then a visit to the City Market (near Sevilla-Biltmore Hotel). Every one wants to see the Market and early in the morning is the best time.

9:00 a. m., visit to the President's Palace by special invitation and very probably will be publicly received by General Gerardo Machado, President of the Republic of Cuba. Leave President's Palace for sightseeing trip embracing some of the city not already covered and some nearby country, visiting University Hill, where is located the School of Medicine, University of Havana and the University Hospital (Calixto Garcia Hospital) (stop). Return to the Malecon Drive, passing the Maine Monument, through Vedado, Carlos Miguel de Cespedes Avenue, Yacht Club, subdivisions and villages of Arroyo Arenas, El Cano and Wajai and Vento Springs, which supplies Havana with water. A visit to Quinta Covadonga, hospital of the Association Centro Asturiano (stop). Arrive at the Tropical Gardens, a very beautiful place, about 1:00 p. m., for lunch, consisting of sandwiches, fruits and drinks. During the lunch there will be music by a typical Cuban orchestra. Leave Tropical Gardens about 2:30, driving through Colon Cemetery and visiting the Municipal Hospital (stop). Trip ends at the new Capitol, where a personally conducted tour of the Capitol will be given. The Capitol is under construction, but will be practically completed by the time of the tour and is being seen by special arrangement. It is one of the most beautiful buildings on the Western Hemisphere, costing sixteen million dollars, and is alone worth the trip to Cuba to see.

Remainder of afternoon free.

8:00 p. m., banquet and dinner-dance on the roof of the Sevilla-Biltmore Hotel (informal). This banquet will be a colorful affair, with a fine orchestra and entertainment particularly Spanish. A number of leading physicians of Cuba and their wives will be invited to be the guests of the Association at this banquet. The banquet will prove to be one of the most delightful occasions of the trip to Cuba.

TUESDAY, NOVEMBER 26

Leave at 9:30 for a trip to Matanzas, a large and interesting city and capitol of the Province of Matanzas, about seventy miles over the National Highway, a fine paved road. On this trip typical rural life will be seen, a large sugar mill, the beautiful Yumuri Valley and Bellamar Caves (the "Mammoth Cave of Cuba"), with lunch at a typical Cuban hotel in Matanzas, arriving back to Havana late afternoon. This is a wonderful trip, seeing Cuba at its best, and it, too, is worth the price of a trip to Cuba.

Evening free. No entertainment provided. Dinner not provided on tour.

WEDNESDAY, NOVEMBER 27

Breakfast at hotel.

Leave from hotel 9:30 a. m. for docks. Ship sails at 10:30 a. m. (luncheon on ship), arriving at Key West at 4:30 p. m. The Havana Special leaves Key West at 6:00 p. m., making all connections at Jacksonville Thursday morning for points North, East and West.

All sightseeing and the trip to Matanzas will be in seven-passenger Lincoln and Packard automobiles, and will be handled by Mr. Charles E. Seijo, Manager of the Transportation Department of the Sevilla-Biltmore Hotel. Competent guides and lecturers will accompany all sightseeing trips to explain points of interest.

Although arranged differently, the sightseeing embraces all that is covered by the standard sightseeing trips offered to tourists in Havana—the city trip, night trip, Morro Castle and Cabanas Fortress trip, the so-called country trip, and the Matanzas trip. *Everything worth seeing that can be seen in the length of time available is covered in the sightseeing program.*

Tour complete, all expense, includes (1) rail and boat transportation Miami to Havana and return to Miami, including meals and stateroom accommodations aboard ship, (2) pullman berth, Miami to Key West, (3) sightseeing in Key West, (4) breakfast on ship on morning of arrival at Key West, (5) transfer of person and baggage in Havana, dock to hotel and hotel back to dock, (6) hotel room in Havana, (7) all meals in Havana except dinner Sunday and Tuesday evenings, (8) banquet, (9) all sightseeing and trip to Matanzas as described in tour, (10) Cuban tax of $3.00—the five-day tour complete, *all for $92.50.*

All details of the tour have been very carefully worked out after a survey of Cuba. All services have been contracted for at the lowest prices, quality considered, and are on a definite flat rate basis. At the price quoted for the tour there is a margin of profit. Of necessity a tour cannot be priced at exactly the total of the cost of service items embracing the tour—the tour should be priced at an over and above cost, so there is something for emergencies and for the expense in connection with developing the tour. Any one going independently will find that to cover what has been provided in this tour the cost will be in excess of what the tour is priced. There are some things in this tour which do not come in the ordinary Havana tours. Any profit which may come from this tour, after all expenses have been paid, goes to the Southern Medical Association. All business pertaining to this tour is cleared through the books of the Association, as are all other items of Association business.

A Four-Day Tour—$77.50

Saturday, Sunday and Monday same as five-day tour.

TUESDAY, NOVEMBER 26

Breakfast at hotel.

Leave from hotel 9:30 a. m. for docks. Ship sails at 10:30 a. m. (luncheon on ship), arriving at Key West at 4:30 p. m. The Havana Special leaves Key West

at 6:00 p. m., making all connections at Jacksonville Wednesday morning for points North, East and West.

Tour complete, all expense, includes (1) rail and boat transportation Miami to Havana and return to Miami, including meals and stateroom accommodations aboard shpi, (2) pullman berth, Miami to Key West, (3) sightseeing in Key West, (4) breakfast on ship on morning of arrival at Key West, (5) transfer of person and baggage in Havana, dock to hotel and hotel back to dock, (6) hotel room in Havana, (7) all meals in Havana except dinner Sunday evening, (8) banquet, (9) all sightseeing except Matanzas trip as described in tour, (10) Cuban tax of $3.00—the four-day tour complete, *all for $77.50.*

Five-Day Tour the Airway—$143.00. Leave Miami Saturday, November 23, via regular passenger plane of the Pan-American Airways, 8:00 a. m., arriving Havana 10:15 a. m. Leave Havana Wednesday, November 27, 3:30 p. m., arrive at Miami 5:45 p. m. All other items of tour same as already outlined.

Four-Day Tour the Airway—$128.00. Leave Miami Saturday, November 23, via the regular passenger plane of the Pan-American Airways, 8:00 a. m., arriving Havana 10:15 a. m. Leave Havana Tuesday, November 26, 3:30 p. m., arrive at Miami 5:45 p. m. All other items of tour same as already outlined.

Five-Day Tour, the Airway Going and Boat Returning—$126.50. Leave Miami Saturday morning by Pan-American Airways plane, returning Wednesday morning by boat. Return trip and all items of tour same as already outlined.

Four-Day Tour, the Airway Going and Boat Returning—$111.50. Leave Miami Saturday morning by Pan-American Airways plane, returning Tuesday morning by boat. Return trip and all items of tour same as already outlined.

Reservations should be made direct to

SOUTHERN MEDICAL ASSOCIATION,
Empire Building,
Birmingham, Alabama

Passports are not required of citizens of the United States entering Cuba from United States ports or leaving Cuba for United States ports, nor are income tax clearances required. It is well for naturalized citizens of the United States to have with them their final naturalization papers. Citizens of other countries must hold passports or immigration visas as required by the United States, and also be able to comply with all Government regulations respecting their entry into the United States.

Visitors to Cuba are allowed to bring all necessary personal belongings to be used while there and not intended for sale. The customs authorities are liberal in their interpretation of the law as long as they are satisfied with the good faith of the visitor. Citizens of the United States returning from Cuba are allowed to bring into the United States, duty-free, articles bought in Cuba to the value of one hundred dollars. In addition, they may bring in fifty cigars or three hundred cigarettes. Aigretts and other plummage of wild birds are liable to confiscation by United States authorities.

Two cartons of American cigarettes can be taken into Cuba duty-free, but they require six cents stamp tax for each package, which has to be put on by the customs officials on the dock at Havana, and this takes quite a bit of time. It is recommended that Cuban smokes be the style while in Cuba. (American cigarettes sell for about 60c a package in Cuba.)

Any one who may go on the five-day tour and wishes to remain in Cuba longer than five days may do so by settling with the hotel for hotel accommodations after breakfast Wednesday morning. The round trip rail and boat fare Miami to Havana and return is good for ten days.

The Peninsular and Occidental Steamship Company, in connection with the Florida East Coast Railroad, have put put into effect a special rate Miami to Havana, and return to Miami, $27.50, effective for boats sailing from Key West Friday morning, Saturday morning, and Monday morning, November 23, 24 and 26, final limit of tickets ten days. Pullman fare Miami to Key West, $3.50. Regular one-way fare via boat and rail, Miami to Havana, or vice versa, $24.70.

Pan-American Airways, operating ten passenger, trimotor planes, leave Miami every day at 8:00 a. m., arriving at Havana at 10:15 a. m., and leave Havana every day at 3:30 p. m., arriving at Miami at 5:45 p. m., will hold in effect for the Southern Medical Association their summer rate of $41.25, Miami to Havana, or vice versa, this being at 25 per cent reduction from regular fare; round trip $82.50.

Those who plan to remain in Florida, or in Cuba, longer than five days after the meeting should purchase railroad tickets to Miami on the one and three-fifths fare, round trip. For those who live in the territory East of the Mississippi River, South of the Ohio River, South of and including the Chesapeake and Ohio Railroad in West Virginia and the Potomac River have a rate of one and one-half fare for the round trip, final limit November 30, or one and three-fifths for the round trip, final limit of thirty days. Those living West of the Mississippi River have a rate of one and one-half fare for the round trip, final limit November 28, or one and three-fifths fare for the round trip, final limit thirty days. Those living in West Virginia, North of the Chesapeake and Ohio Railroad, and in Maryland and other parts of the United States have a rate of one and one-half fare for the round trip, final limit November 28, or one and three-fifths fare, round trip, final limit thirty days.

Miami---Where We Meet

FALL CLIMATE OF MIAMI*

Probably nothing has had such an important part in developing Miami as a playground as has its climate. The climate is said to have made a profound impression on the Spaniards who came to Florida's shores centuries before promoters developed the idea of real estate subdivisions.

Then, as now, the word was passed that the climate was salubrious. It was said that neither cold nor heat was felt here.

A typical bathing group on the Beach at Miami. November weather permits such scenes.

Of late years it becomes increasingly apparent that thousands come to Miami to escape cold weather. The influx generally begins in November when chill rains in the North are initiating winter.

This is the season when the weather becomes settled in Miami, after the rainy and, on occasions, windy, season. There is a distinct difference in the climate of southern Florida during the winter months. Not all of Florida enjoys the mild weather, brilliant sunshine and warm breezes. North Florida is not in the tropical zone, which extends not a great deal farther north than Fort Pierce.

For the members of the Southern Medical Association who convene in November, the United States Bureau has offered some information through Meteorologist Richard W. Gray.

The average daily temperature for November is 73 degrees, with an average maximum of 78 and an average minimum of 66. The average rainfall for November is 3.08 inches, with an average of less than one day without sunshine. The wind velocity for November is at a comfortable average of ten miles per hour, which assures those unaccustomed to warm weather of a cooling breeze.

The physicians, Mr. Gray assures us, need have no fear that a tropical rain will dampen their convention ardor. The period immediately following October 20 and extending through November is the driest of all seasons.

Those who try deep sea fishing may encounter a choppy sea now and then. The Gulf Stream, due to the prevalence of northeast winds, is likely to be a little rougher than usual, Mr. Gray says, but not rough enough to prevent the fishing fleet from going out after the crafty sailfish.

Winter weather always brings a slightly rougher sea, but it is only on rare occasions that the Gulf Stream is too rough for comfortable navigation by the fishing boats.

With the promise of such weather the medical men can be assured that it will be warm enough to make sea bathing a pleasure and motoring one of the convention's best features.

*By Charles C. Canny, Publicity Department, City of Miami.

MIAMI HOTELS

If one writes to the hotel of his choice and does not hear within a reasonable time, or that particular hotel has reservations to its capacity, write to Dr. Bascom H. Palmer, Jr., Huntington Building, Miami, Florida, who is Chairman of the Committee on Hotels. He and his committee will take great pleasure in seeing that comfortable accommodations are arranged for all who desire to attend the Miami meeting. In writing either to the hotel or Dr. Palmer, state the kind and price of accommodations desired, the day the reservation is to become effective, and if possible give the time of day the reservation is to begin.

The first five hotels, the McAllister, Columbus, Watson, Everglades and Alcazar, are on Biscayne Boulevard overlooking Miami's lovely tropical park and beautiful Biscayne Bay. The McAllister Hotel is now booked to capacity (9-30-1929).

McALLISTER HOTEL (General Hotel Headquarters)
Single room with bath, $4.00 and $5.00.
Double room with bath (twin beds), $8.00.

COLUMBUS HOTEL (Headquarters for American Society of Tropical Medicine and Southern Association of Anesthetists)
Single room with bath, $4.00 and $5.00.
Double room with bath, $6.00, $7.00, $8.00.

WATSON HOTEL
Single room with bath, $3.00 to $5.00.
Double room with bath, $5.00 to $8.00.

EVERGLADES HOTEL
Single room with bath, $3.00.
Double room with bath, $5.00.

ALCAZAR HOTEL
Single room with bath, $5.00.
Double room with bath, $8.00.

URMEY HOTEL
Single room with bath, $4.00.
Double room with bath, $7.00.

LEAMINGTON HOTEL
Single room with bath, $3.00 and $3.50.
Double room with bath, $5.00 and $6.00.

DALLAS PARK HOTEL
Single room with bath, $3.50, $4.00 and $5.00.
Double room with bath, $5.00, $6.00 and $7.00.

GRAYLNN HOTEL
Single room with bath, $4.00 and $5.00.
Double room with bath, $6.00 and $7.00.

PONCE DE LEON HOTEL
Single room with bath, $3.00 to $5.00.
Double room with bath, $5.00 to $8.00.

ALHAMBRA HOTEL
Single room with bath, $3.00.
Double room with bath, $5.00.

PERSHING HOTEL
Single room with bath, $3.50.
Double room with bath, $5.00 and $6.00.

EL COMODORO HOTEL
Single room with bath, $3.50 and $4.00.
Double room with bath, $6.00 and $7.00.

Correspondence

HEALTH COLUMN

Editor, SOUTHERN MEDICAL JOURNAL:

The Duval County Medical Society is thinking of running a Question and Answer Column in one of our daily papers. It is our understanding that such health advice columns are approved of by the American Medical Association. Please inform us if such publicity columns have been successfully run elsewhere in the Southern states. We would also like to know the best way of conducting such programs: whether the questions should be answered by a committee appointed by the President or whether it is best carried out by one good man.

KENNETH A. MORRIS, Secretary,
Duval County Medical Society.

Jacksonville, Fla., September 11, 1929.

(EDITOR'S NOTE: There should be nothing unethical in such an undertaking. A small committee could be selected to act as it sees fit, either collectively or through one of its appointees. Of course the Society and not the Committee should sign all communications, to avoid unfair publicity for any individuals. Should a suitable physician be found who is not in active practice, he could be empowered to conduct and sign the column under his own name. The experience of other medical societies is desired by the Editor.)

Book Reviews

Handbook of Bacteriology. For Students and Practitioners of Medicine. By Joseph W. Bigger, M.D., Sc.D. (Dublin), F.R.C.P.I., D.P.H., M.R.I.A., Professor of Bacteriology and Preventive Medicine, University of Dublin; Bacteriologist Sir Patrick Dun's Hospital, and the Royal City of Dublin Hospital. Second Edition. 462 pages, illustrated. New York: William Wood and Company, 1929. Cloth, $5.00.

A manual of this type far from being a cram-book can help the student master the fundamental facts of bacteriology in a short time. Despite its limited size it incorporates in its pages the important recent contributions in this field. It covers in brief all the phases of bacteriological and serological technic. There are several chapters on the most common forms of bacteria and protozoa, also a thorough discussion of immunity and anaphylaxis.

The Healthy Baby. The Care and Feeding of Infants in Sickness and in Health. By Roger H. Dennett, B.S., M.D., D.Sc., Professor of Diseases of Children and Director of the Department in the New York Post-Graduate Medical School. New edition, revised with new matter. 266 pages. New York: The Macmillan Company, 1929. Cloth, $1.25.

The book contains much valuable information for the mother. It particularly deals with the every day details which many physicians fail to discuss with their patients, permitting them to gain erroneous ideas from neighborhood gossip. Stress is well placed on sunshine and hygiene. The advice on clothing is not quite applicable to the Southern states. The author is somewhat conservative in his feeding advice, but it is probably wise to err on this side when the information is primarily for the laity.

The Challenge of Chronic Diseases. By Ernst P. Boas, M.D., Attending Physician, Montefiore Hospital for Chronic Diseases, and Nicholas Michelson, M.D., Adjunct Physician, Montefiore Hospital for Chronic Diseases. 197 pages. New York: The Macmillan Company, 1929. Cloth, $2.50.

Written primarily for the educated layman, the book nevertheless is of interest to the physician, for it presents a problem which he must face both as physician and as citizen. The authors have given thorough and careful study to this problem of chronic diseases, and suggest certain methods of its solution.

American Illustrated Medical Dictionary. A complete Dictionary of the terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Nursing, Veterinary Medicine, Biology, Medical Biography, etc. By W. A. Newman Dorland, M.D., Member of the Committee on Nomenclature and Classifications of Diseases of the American Medical Association. Fifteenth Edition, Revised and Enlarged. Octavo of 1427 pages, 525 illustrations, 107 of them in colors. Philadelphia and London: W. B. Saunders Company, 1929. Flexible binding, Plain $7.00 net; Thumb Index $7.50 net.

This, it will be noted, is the fifteenth edition of Dorland's dictionary. The book is an accepted standard, and on account of the additions and changes in medical terminology the new edition is welcomed.

Principles and Practice of Electrocardiography. By Carl J. Wiggers, M.D., Professor of Physiology in the School of Medicine of Western Reserve University, Cleveland, Ohio. 226 pages with 61 illustrations. St. Louis: The C. V. Mosby Company, 1929. Cloth, $7.50.

A number of books on this subject have recently been written. In none of them, with the exception of Lewis' large volume, are the physical principles underlying electrocardiography so well discussed as in the present volume. The book is particularly valuable because of the physics and physiology contained in it. The different types of electrocardiographs are discussed. There is a good presentation of the theoretical significance of various deviations from the normal. The data concerning treatment are theoretical rather than practical, and may perhaps "be taken with a grain of salt."

Getting Ready to Be a Mother. By Carolyn Conant Van Blarcom, R.N., Formerly Assistant Superintendent and Instructor in Obstetrical Nursing and the Care of Infants and Children at the Johns Hopkins Hospital Training School for Nurses. With an introduction by J. Clifton Edgar, M.D., Emeritus Professor of Obstetrics and Clinical Midwifery in the Cornell University Medical College. Second Edition, Revised. 286 pages with 82 illustrations. New York: The Macmillan Company, 1929.

In her usual attractive, clear style Miss Van Blarcom presents a volume that will be a very useful handbook to the expectant mother. Subjects of importance receive most attention and are reduced to practical hints, which render the volume an instructive guide.

Ante-Natal Care. By W. F. T. Haultain, O.B.E., M.C., B.A., M.B. (Camb.), F.R.C.S.E., Senior Assistant Obstetric Physician and late Special Assistant to Ante-Natal Department, Edinburgh Royal Maternity and Simpson Memorial Hospitals; and E. Chalmers Fahmy, M.B. (Edin.), F.R.C.S.E., with Foreword by Professor R. W. Johnstone, C.B.E., M.A., M.D., F.R.C.S.E., Professor of Midwifery and Diseases of Women, University of Edinburgh. 113 pages. New York: William Wood & Co., 1929. Cloth, $2.25.

This volume is simply a review of well known and universally accepted ante-natal work. Because of its simplicity in presentation it will serve as a useful hand guide to the uninitiated.

Your Nose, Throat and Ears, Their Health and Care. By L. W. Oaks, M.D., and H. G. Merrill, M.D. 163 pages. New York and London: D. Appleton & Co., 1929. Cloth, $1.50.

This book in popular style might have been of very great use twenty years ago, but at the present time the public seems to have become a bit over-educated on the subject. The volume undertakes to explain what the average parent and teacher should know about diseases of the nose, throat, and ears. It is brief, definite, and conservative. The one paragraph on swallowing of lye might well be transcribed on the walls of every American kitchen. The few paragraphs on physiology of the nose are to be especially commended.

Diseases of the Larynx, Including those of the Trachea, Large Bronchi and Esophagus. By Harold Barwell, M.B. (Lond.), F.R.C.S. (Eng.), President of the Section of Laryngology, Royal Society of Medicine. Third Edition. 278 pages, illustrated. New York: Oxford University Press, 1928. Cloth, $3.65.

This is the third edition of a little work that has been popular for twenty years. It contains some splendid material, but it would seem unnecessary to encumber a book for the general physician and student wit hall the details of endoscopy and laryngectomy, operations undertaken only by the more thoroughly trained specialists. The illustrations are abundant and good. A chapter on lues is especially good. The polypharmacy evidenced in the formulae in the appendix is sufficient evidence that treatment is often unsatisfying. The volume will be of interest to the general practitioner and student, but of more real value to the young specialist.

Diagnosis and Treatment of Deformities in Infancy and Early Childhood. By M. F. Forrester-Brown, M.S., M.D. (Lond.), Surgeon, Bath, Somerset and Wilts Central Children's Orthopedic Hospital. With a foreword by Sir Robert Jones, Bart., K.B.E., C.B., F.R.C.S. New York: Oxford University Press, 1929.

The evident neglect and mistaken advice received by most cripples before they come to an orthopedic clinic are proof of the need of such a book as this. The physician who visits the home sees few deformed children, but it is of extremely serious consequence to these few if he fails to advise correctly or institute proper early treatment. Without the encumbrance of an overload of technical details this small book constitutes a source of much information upon the diagnosis and treatment of juvenile deformities. It puts the general practitioner on his guard against overlooking such obscure infantile deformities as congenital dislocation of the hip, which, while amenable to early treatment, later become resistant to correction. It will prevent such mistakes as advising parents of children with congenital clubfoot to "wait until the baby is older, then take him to an orthopedic specialist." It will show him how to prevent those deformities of gradual development which often are impossible of correction by the time the orthopedic clinic is reached. The book contains much that is original and is unusually well presented.

Physical Examination and Diagnostic Anatomy. By Charles B. Slade, M.D., formerly Chief of Clinic in General Medicine, University and Bellevue Hospital Medical School, New York. Fourth Edition, thoroughly revised. 12mo. of 196 pages with 43 illustrations. Philadelphia and London: W. B. Saunders Company, 1929. Cloth, $2.00 net.

The author's experience has been that in teaching physical diagnosis a short, concise text is all that is required. The usual methods of physical diagnosis are given in an elementary manner. With the present educational requirements of medical schools the use for this type of book, unless supplemented by lectures, seems doubtful. The practising physician has little reason to use the book.

Southern Medical News

ALABAMA

The Alabama Railway Surgeons met for a two-day session in Birmingham, September 2-3, and at the close of meeting the following officers were elected: Dr. R. L. Sutton, Orrville, President; Dr. G. H. Moore, Opelika, Vice-President, and Dr. J. U. Ray, Woodstock, Secretary-Treasurer. Montgomery will be the next meeting place.

Atmore General Hospital, Atmore, had its formal opening on August 24th with more than 400 medical men from Alabama and Florida in attendance.

The Riser Sanitarium, Lafayette, will soon be opened with Dr. W. H. Riser in charge.

Dr. J. A. Jackson, Sulligent, has been elected County Health Officer of Lamar County, succeeding Dr. T. E. Cato, who resigned recently to accept a position with the State Board of Health of West Virginia.

Dr. Lucius S. Nichols, Abbeville, has been appointed County Health Officer for Geneva County.

Dr. Miles A. Copeland, Birmingham, announces his removal from the Watts Building to Woodward Building.

Dr. H. E. Leming, Health Officer for Escambia County, held a clinic for children at the beginning of school. Dr. Leming has examined 2982 school children during the first six months of this year and found 1906 of these defective. Of this number 222 had the defects corrected, and 215 were found to be physically perfect children.

Dr. L. R. Murphree, Athens, County Health Officer, announces that medical and physical examinations will be given every school child in the County.

Dr. Walter Boyce Rountree, Hartselle, and Miss Cornelia Mae Lamb, Nashville, Tennessee, were married June 17.

Deaths

Dr. Samuel Colvin Cowan, Union Springs, aged 68, died August 10 following an operation for appendicitis.

Dr. Henry Stanford Persons, Montgomery, aged 60, died June 24, following an operation for brain tumor.

ARKANSAS

The Basic Science Board held its first meeting in July at Little Rock and elected the following officers: Dr. M. J. McHenry, Conway, Chairman; Dr. Louis E. Gebauer, Little Rock, Secretary; and Dr. S. C. Dellinger, Fayetteville, Treasurer. Other members of the Board are Dr. E. L. Whitsit, Jonesboro; Dr. D. A. Spessard, Arkadelphia, and C. M. Hirst, State Superintendent of Public Instruction.

Dr. Pauline Tenzel, Little Rock, has opened offices in the Donaghey Building for the practice of diseases of children.

Dr. Sloan M. Sanford, Little Rock, announces the opening of his office in the Donaghey Building, limiting his work to diseases of the eye.

Dr. T. M. Mitchell, formerly of Mountainburg, has removed to Rudy.

Dr. Gordon Hastings, former Director of the Public Health Unit of Union County, has been appointed Supervisor of Rural Sanitation in Arkansas, with headquarters at Little Rock.

The Ninth Councillor District Medical Society met in July at Harrison and the following officers were elected for the year: Dr. J. G. Gladden, Western Grove, President; Dr. D. L. Owens, Harrison, First Vice-President; Dr. J. C. Blackwood, Harrison, Second Vice-President, and Dr. J. R. Fowler, Harrison, Secretary-Treasurer.

Dr. A. B. Williamson, formerly of Chickalah, has moved to Alpin.

Dr. Frank Vinsonhaler, Little Rock, was presented with a set of silver by the Arkansas Medical Society in appreciation of his service in the passage of the Basic Science Bill.

Deaths

Dr. John Smith Waddle, Hope, aged 80, died July 11 of mitral stenosis.

Dr. William Wesley Ireland, Gentry, aged 73, died June 17 of carcinomatosis.

DISTRICT OF COLUMBIA

At a recent meeting of the Medical Society of the District of Columbia the following officers were elected: Dr. John A. Foote, President; Dr. William J. Mallory and Dr. Kate B. Karpeles, Vice-Presidents; Dr. Coursen B. Conklin, Secretary-Treasurer (re-elected); Dr. Henry C. Macatee, Delegate to the A. M. A. with Dr. Frank Leech as Alternate; Executive Committee, Dr. Harry H. Kerr, Dr. R. Arthur Hooe and Dr. Wm. H. Hough, all of Washington.

Major Robert D. Harden, Medical Corps, U. S. Army, was recently appointed a member of the National Board of Medical Examiners. He will succeed Col. Joseph F. Siler, who has been detailed to Canal Zone.

A typhoid epidemic recently followed a luncheon of the Arlington County W. C. T. U. at Washington. Nine women out of the thirty-one present developed typhoid which is believed to have been due to a carrier who assisted in preparing the food.

Deaths

Dr. Abraham Chenoweth Larkin Percefull, Washington, aged 54, died July 14 of carcinoma of the bladder.

Dr. Harry C. Frankenfield, Washington, aged 66, died July 29 of injuries received when struck by an automobile.

FLORIDA

Dr. Wm. N. Parkington, St. Augustine, formerly Chief Surgeon of the Florida East Coast Railway and Hospital, has been appointed Dean of the Temple University School of Medicine, Philadelphia.

Dr. F. L. Fort, Jacksonville, has returned from Europe, where he attended the meeting of the American and British Orthopedic Associations in London. While away Dr. Fort visited clinics in New York, Liverpool and London.

Dr. G. F. Oetjen and Dr. C. B. Mabry, Jacksonville, have returned from Europe. While there they visited Germany and France and also took short courses at the University of Berlin.

Dr. James K. Biddle, formerly of Daytona Beach, has moved to Mansfield, Ohio.

Dr. Oliver James Hart has moved from Tampa to the New York Post-Graduate Medical School and Hospital, New York.

Dr. Joel Whitaker, Miami, has removed to Indianapolis, Indiana.

Dr. W. P. Duncan, Tampa, announces the removal of his offices to Tampe Theatre Building.

Dr. Chas. D. Cleghorn, Miami, has moved his offices to the Huntington Building.

Dr. H. Quillian Jones, Fort Myers, has become associated with Dr. J. William Jones, and they have moved to larger offices in the Leon Building.

Deaths

Dr. David Granville Humphreys, Jr., Jacksonville, aged 29, died June 25 of agranulocytic angina.

Dr. Woodford John Copeland, Coral Gables, aged 54, died August 10 of angina pectoris.

Dr. James Romulus Klyce, Ellenton, aged 77, died June 28 of uremia, following prostatectomy.

GEORGIA

Dr. Lloyd B. Taylor, Savannah, was appointed Captain of the Medical Detachment of the 118th Field Artillery and attended the annual encampment at Camp Jackson, South Carolina.

Dr. Hamilton G. Ansley, Decatur, has become associated with his father, Dr. W. S. Ansley, in the practice of medicine.

Dr. J. M. Byne, Jr., a recent graduate of the University of Georgia Medical Department, has located at Waynesboro.

Dr. W. L. Pomeroy, Waycross, is now associated with Dr. Raymond L. Johnson.

Dr. George F. Eubanks, Jr., Atlanta, has opened offices in the Hurt Building.

Dr. Edwin S. Wright, Atlanta, has become associated

with Dr. Calhoun McDougall, practicing otology, laryngology and rhinology, with offices in the Medical Arts Building.

Dr. J. Harold Nicholson, Atlanta, has moved his offices to 26 Linden Avenue.

Dr. Bomar A. Olds has returned to Atlanta to practice after three years at the Massachusetts Eye and Ear Infirmary and Harvard Medical School doing postgraduate work in ear, nose and thoat, and opened offices in the Medical Arts Building.

Dr. Edgar Boling, Atlanta, is now associated with Dr. T. C. Davison, with offices at 478 Peachtree Street.

Dr. Earl Kilpatrick Lazenby, Augusta, was married to Miss Mattilu Phillips of Tifton, June 19.

Dr. Joseph G. Crovatt, Waycross, and Miss Florence Louise Griner, Camilla, were married July 7.

Dr. George B. Adams and Miss Virginia Surtees, both of Atlanta, were married August 3.

Deaths

Dr. Harvey Otis Byrd, Atlanta, aged 43, died June 28 of brain tumor.

Dr. Benjamin F. Johnson, Garfield, aged 57, died June 29 following an operation for gallstones.

Dr. Robert C. Wiley, Sparta, aged 75, died July 16.

Dr. Newton Craig, Atlanta, aged 60, died August 4 of angina pectoris.

Dr. Robert C. Moseley, Atlanta, aged 58, died June 28 after an illness of a year.

Dr. William E. Farley, Columbus, aged 54, died July 16 of intestinal obstruction and myocarditis.

Dr. George Washington Bordeaux, Chester, aged 61, died June 26 of nephritis.

KENTUCKY

The Scott County Medical Society recently sponsored tuberculosis clinics at Sadieville, Georgetown and Stamping Ground.

Trachoma clinics were held in Perry, Leslie and Clay Counties in July by Dr. Robert Sory, who is the surgeon in charge of the Irvine-McDowell Memorial Hospital, Richmond. This work was done under the joint supervision of the Kentucky State Medical Association and the U. S. Public Health Service. Dr. Sory recommends the leasing of another building for trachoma work. The Irvin-McDowell Hospital has a capacity of thirty beds and is always filled and has a waiting list of more than twice as many.

Dr. Leon L. Solomon, Louisville, has removed his offices to the Breslin Medical Arts Building.

Dr. J. Kenneth Hutcherson, Louisville, announces the removal of his offices to the Francis Building.

Dr. Wm. Barnett Owen and Dr. Robert Lee Woodard, Louisville, announce their partnership in orthopedic surgery, with offices in the Heyburn Building.

Dr. Arthur Clayton McCarty, Louisville, has moved his offices to the Heyburn Building.

Dr. Robert Lee Bird and Mrs. Deliah Herbert, both of Covington, were married in July.

Deaths

Dr. Thomas Liggett Baley, Madisonville, aged 41, died June 23 of pneumonia.

Dr. Phil Lee Fuson, Arjay, aged 43, died July 6 of peritonitis following an operation for appendicitis.

Dr. Edward Stumbo, Martin, aged 49, died July 3 of pneumonia.

Dr. Thomas Stapleton Bullock, Lexington, aged 70, died July 27 of multiple sclerosis.

LOUISIANA

Dr. Amedee Granger, New Orleans, Head of the Department of Radiology of the Graduate School of Medicine of the Tulane University of Louisiana, and Director of the X-ray Department of the Charity Hospital, has received, through the Consul-General of Belgium, the citation conferring upon him the distinction of Knight of the Order of the Crown. This distinction is next to the highest conferred by Belgium and is ranked only by the Order of Leopold, outranking the Order of Leopold II. This honor was bestowed upon Dr. Granger in recognition of his philan-

(Continued on page 34)

Massachusetts General Hospital

Boston, Massachusetts

Graduate Course In Surgery

NOVEMBER, 1929

Daily 9 A. M. to 4 P. M.

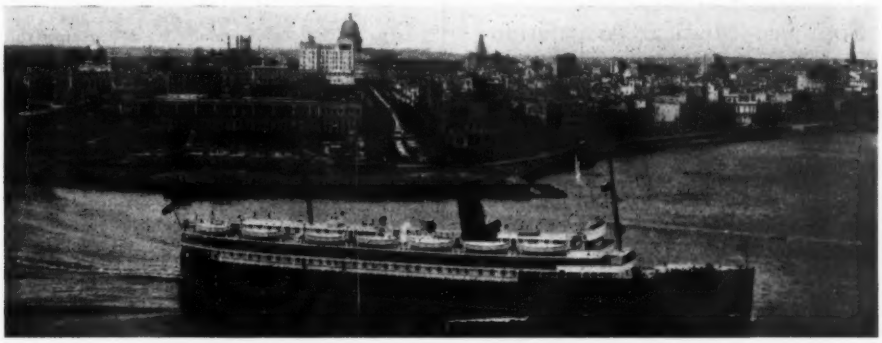
The morning sessions will be given over chiefly to observation in the operating rooms and special clinics.

There will be opportunities to attend ward visits of Special Clinics at regular specified intervals each week. The Clinics include Fractures, Chest Surgery, Peripheral Circulatory Diseases, and Diabetic Surgery.

The afternoon sessions will include at least one lecture or demonstration, and an opportunity to examine new cases admitted to the hospital.

Attendance limited to twelve. Fee $100, plus $5 registration fee.

Detailed prospectus of course sent on request. Applications should be made to the Assistant Dean, Courses for Graduates, Harvard Medical School, Boston, Massachusetts.



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At the request of the Southern Medical Association reduced round-trip rates have been authorized for its members attending the Miami Meeting, November 19-22.

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The Association has arranged an official S M A all-expense personally conducted post-convention tour. Everything worth seeing that can be seen in the time given will be seen and there is some special entertainment arranged for the physicians and their ladies. See page 947 for full details and price. Reservations should be made to the Association office at Birmingham.

Picture to the left is Sevilla-Biltmore Hotel, on the beautiful Prado, general headquarters for the tour.

SOUTHERN MEDICAL ASSOCIATION
Empire Building
Birmingham, Alabama

Note the striking picture of Havana at top of page. The beautiful Prado is seen just at the left of the steamer smokestack; the high, white building is the Hotel Seville-Biltmore; the dome just over and to the right of the hotel is the new Capitol, now nearing completion, and one of the most beautiful buildings, inside and out, on the Western hemisphere, costing sixteen million dollars (worth a trip to Cuba to see); the building to the extreme left with dome and park in front is the President's Palace. Those on our tour will be personally conducted through the Capitol and will be received at the President's Palace.

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MIAMI, FLA., NOV. 19-22
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" Knoxville	3:49 A.M., Nov. 18
Arrives Atlanta	8:40 A.M., Nov. 18

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" Evansville	9:20 P.M., Nov. 17
" Nashville	1:40 A.M., Nov. 18
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Why not go with the President the President's Way?

(Continued from page 954)

thropy in presenting the Kingdom of Belgium the unrestricted use of his valuable apparatus for the localization of foreign bodies with the x-ray. The apparatus proved of enormous service during the World War.

The Board of Directors of the Charity Hospital, New Orleans, has allocated five hundred beds in the hospital for the exclusive use of the Tulane School of Medicine.

Dr. Wilson W. Knowlton, New Orleans, who resigned as Director of the St. Landry Parish Health Unit, was tendered a banquet by the St. Landry Parish Medical Society. Dr. Junes Victor Roule, Jr., was appointed to succeed Dr. Knowlton.

Dr. Rudolph Matas, New Orleans, was recently elected one of the Honorary Presidents of the International Congress of Surgery, at their recent meeting in Warsaw, Poland.

Dr. John L. Kelly, Oak Grove, has been appointed a member of the State Board of Health.

Dr. Herbert R. Unsworth, New Orleans, Director of Bureau of Mental Hygiene of the State Board of Health, has been appointed Consulting Neurologist to the East Louisiana State Hospital at Clinton.

During the week ending August 10, there were 153 deaths in New Orleans, 82 of whom were white and 71 colored. Fifteen children under one year of age died during the week, 11 of whom were colored, with a death rate of 18.5. During the corresponding week of last year there were 150 deaths with the death rate of 18.3, approximately the same as this year.

Dr. Oswald Fenton Hedley, New Orleans, was married to Miss Charlotte Marie Best, Round Hill, Virginia, June 26.

Deaths

Dr. Robert Glen Gilbert, New Orleans, aged 63, died February 15 of acute dilatation of the heart.

Dr. John Lamar Kimbell, Shreveport, aged 67, died June 29 of heart disease.

(Continued on page 36)

OFFICIAL ROUTE:

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PRESIDENT'S SPECIAL

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From Atlanta—November 18th

Nov. 18—Lv. Atlanta	9:05	a.m.	C.ofGa.Ry
Lv. Macon	11:40	a.m.	C.ofGa.Ry
Lv. Albany	3:20	p.m.	A.C.L.Ry.
Lv. Waycross	6:40	p.m.	A.C.L.Ry.
Ar. Jacksonville	8:45	p.m.	A.C.L.Ry.
Lv. Jacksonville	9:35	p.m.	F.E.C.Ry.
Nov. 19—Ar. Miami	7:30	a.m.	F.E.C.Ry.

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Subtle symptoms which only the family physician may recognize are often of the greatest importance in deciding upon the correct diagnosis. For the x-ray, in addition to showing the presence of disease, is of great value in determining its extent, that is, the stage that it has reached.

The treatment and prognosis will certainly differ at different stages in the progress of the infection. It is necessary, therefore, that the general practitioner not only refer his patients to the roentgenologist for radiographs but that he work with the roentgenologist in the closest manner.

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(Continued from page 34)

MARYLAND

The Board of Directors and members of the staff of the new Emergency Hospital at Easton invited the physicians of Kent, Queene Anne, Caroline, Talbot and Dorchester Counties to a dinner at the Hospital. The guests formed an associate staff for the Hospital and elected Dr. Henry G. Simpers, Chestertown, President, and Dr. Dawson O. George, Denton, Secretary.

Ten cases of undulant fever were reported to the State Health Department in the first six months of 1929. Only five cases were reported in the same period last year.

The Home for the Infirm, a unit of the Hebrew Home for the Aged and Infirm, Baltimore, was dedicated July 21.

The Wilmer Ophthalmological Institute, Baltimore, will be dedicated October 15-16. The program will include addresses by Hofrat Ernst Fuchs of the University of Vienna on "The Development of Ophthalmology in Europe"; Sir John Herbert Parsons of the University of London, on "Color Vision and Its Anomalies," and Dr. George E. de Schweinitz of the Graduate School of Medicine of the University of Pennsylvania on "Some Contributions and Phases of American Ophthalmology."

Dr. Leon J. Malock has been appointed a member of the staff of the Laurel Sanatorium, Laurel. Dr. Malock has just recently completed his internship at Mercy Hospital, Toledo, Ohio.

Dr. Hugh H. Young, Baltimore, who is Chairman of the State Aviation Commission, is abroad inspecting airdromes and factories in England, Italy, France, Holland, Germany and Switzerland.

Deaths

Dr. Eberle Geddings Welch, Baltimore, aged 79, died June 26 of senility.

MISSISSIPPI

Dr. J. M. Ferguson, Surgeon in charge of the Veterans' Hospital, Gulfport, announces that $150,000 will be spent by the Government in construction of an additional building and improvement of others. This will include recreational buildings, a nurses' home and quarters for medical officers in charge.

Dr. Temple Ainsworth, Laurel, has resigned as Resident Surgeon of the South Mississippi Charity Hospital, to become associated with Dr. Frank Van Aistine, Jackson, in genito-urinary work.

Dr. William F. Hand, State Line, has been appointed Resident Surgeon at the South Mississippi Charity Hospital, Laurel.

Dr. Dana V. Clark, representative of the American College of Surgeons, recently inspected the South Mississippi Charity Hospital, Laurel, and made only three minor recommendations which had to do with the keeping of records. The Hospital has recently improved its buildings and installed new equipment.

Dr. Robert W. Smith, Canton, has been named Health Officer for Madison County.

Dr. Harvey F. Garrison, Laurel, has been appointed Assistant Director of the Jones County Health Unit. He will be in charge during the absence of Dr. Hardie R. Hays, Director, on account of illness.

Deaths

Dr. James Franklin Taylor, Booneville, aged 61, died July 29 of heart disease.

Dr. William Stewart Hamilton, Jr., Jackson, aged 41, died July 1 of nephritis.

MISSOURI

St. Louis University School of Medicine, St. Louis, has made several changes in the organization of departments, including the establishment of a full Department of Radiology with Dr. LeRoy Sante as Director. The Department of Anatomy has been divided into a section of micro-anatomy with Dr. Arthur Kuntz in charge and a section of gross anatomy with Dr. Daniel M. Schoemacker in charge. Dr. William D.

(Continued on page 38)

GETTING FRUITS *and* VEGETABLES INTO *unwilling mouths*

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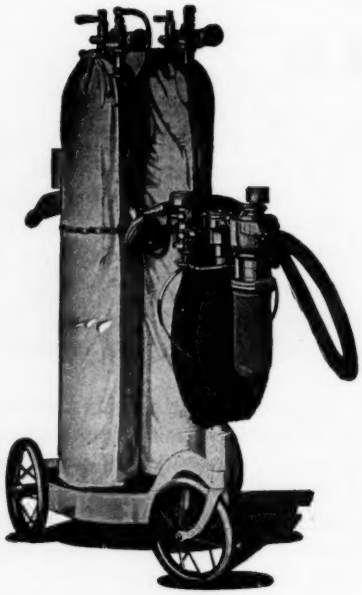

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(Continued from page 36)

Collier has been made Director of the Department of Pathology and Dr. William E. Sauer, Director of the Department of Otolaryngology.

The Gasconade-Maries-Psage County Medical Society met recently and elected the following officers for the ensuing year: Dr. Julius Lingenfelder, Hermann, President; Dr. J. J. Ferrell, Owensville, Vice-President, and Dr. M. E. Spurgeon, Red Bird, Secretary-Treasurer.

Dr. George A. Johns, St. Louis, has been appointed Superintendent of the State Hospital No. 3, at Nevada, succeeding Dr. James H. Parker.

The City Council of Hamilton has passed an ordinance to control the milk supply as recommended by the State Board of Health and all dairies are being rapidly rebuilt to comply with the ordinance. J. P. Clark, V. S., of the State Board of Health, is supervising the work with L. C. Smith, V. S., as local inspector.

At the recent annual meeting of the Missouri Society of Medical Secretaries the following officers were elected for this year: Dr. J. Milton Singleton, Kansas City, President; Dr. C. D. Humberd, Barnard, Vice-President, and Dr. J. T. Hornback, Nevada, Secretary.

The Association of Assistant Physicians of Missouri recently held a meeting at State Hospital No. 4, Farmington.

Dr. William H. Luedde, St. Louis, who is the Director of the Prevention of Blindness Department of the Missouri Association for the Blind, attended the International Ophthalmological Congress in Amsterdam, Holland, on September 10 and presented the Leslie Dana Gold Medal for 1929 to Dr. Ernest Fuchs, Vienna, in recognition of "the most outstanding achievement in the prevention of blindness and the conservation of vision." The medal is given annually by Mr. Leslie Dana of St. Louis, but this is the first time it has gone to anyone outside of the United States.

Dr. Joseph W. Charles and Dr. Martin Haywood Post, Jr., St. Louis, attended the International Ophthalmological Congress in Amsterdam in September.

Dr. Wallace S. Petty, Caruthersville, is now connected with the Department of Child Hygiene Cooperative Health Work of the State Health Department.

At the Central Registry of Nurses, St. Louis, is maintained a list of transfusion donors by the Blood Transfusion Committee of the Community Council. The work was started three years ago by this Committee and since that time 275 transfusions have been given by donors, fifty of which were free. The regular fee given donors for each transfusion is $25.00.

The death rate for Missouri for 1928 was 1,284.9 per hundred thousand of population, as compared with 1,161.1 in 1927. The estimated population for 1928 was 3,523,000 and for 1927, 3,510,000.

Dr. Robert M. Evans, St. Louis, and Miss Irene Brubaker, Russiaville, Indiana, were married July 27.

Dr. Howard Anderson McCordock, St. Louis, and Miss Ruth Darby, Buffalo, were married June 29.

Deaths

Dr. Alfred A. Gray, Calhoun, aged 61, died May 31 of carcinoma of the throat.

Dr. Robert L. Shadburn, Windsor, aged 78, died July 15 of paralysis.

Dr. John Calvin Klepinger, Kansas City, aged 59, died August 8, of cerebral hemorrhage.

Dr. Arthur Vincent Campbell, St. Louis, aged 75, died July 26 of nephritis.

Dr. Hugh James Patton, McFall, aged 62, died June 22 of acute uremia following pyelonephritis.

Dr. Charles Francis Martin, Kansas City, aged 55, died June 27 of bronchopneumonia and myocarditis.

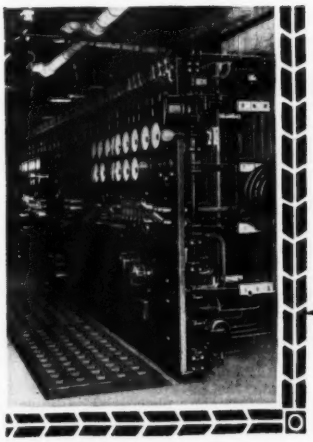
Dr. Herman L. Wichmann, St. Louis, aged 63, died July 13 of cardiac asthma and chronic nephritis.

Dr. Frederick B. Drescher, St. Louis, aged 67, died July 12 of lobar pneumonia.

Dr. Lewis Carthrae, Sr., Corder, aged 84, died July 5 of senility.

Dr. Emmett Pryor Harrison, Raytown, aged 59, died June 17 of mitral insufficiency.

(Continued on page 40)



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The setting is immaterial. It is the scientific point of view, the patient pursuit of a better way, the fine impatience with methods not yet perfect that leads the way to progress. The American X-Ray Corporation well realizes that if it can place today at your disposal X-Ray and Physical Therapy devices of extraordinary precision, beautifully accurate instruments which you can depend on to produce exactly the diagnostic and therapeutic results you anticipate —it is because of these unselfish contributions which you have made to the art.

The Research Laboratory of the American X-Ray Corporation—conceded to be the finest of its kind in the history of the X-Ray industry . . . our Engineering staff, manned by experts of outstanding prominence in their fields — all of these facilities of equipment and manpower are pledged to co-operate with you at all times in any development that leads to progress.

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Light therapy has earned a place of great importance in the efficient treatment of certain diseases. The problem, in many cases, is not whether or not to use light treatment; the problem is just which type to use.

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Authorized Distributors in All Leading Cities

(Continued from page 38)

Dr. Thomas Lee Haney, Flat River, aged 58, died July 22 of acute dilatation of the heart.

NORTH CAROLINA

Dr. L. A. Crowell, President of the State Medical Society, has made the following appointments to represent the Society at the Eleventh Decennial Convention for the Revision of the Pharmacopoeia of the United States of America: Dr. R. O. Lyday, Greensboro; Dr. W. C. Bostic, Forest City, and Dr. I. M. Proctor, Raleigh.

Contract for the City Memorial Hospital, Thomasville, has been let at a cost of $100,000, work to begin soon.

At the recent meeting of the North Carolina Hospital Association the following officers were elected: Dr. D. A. Garrison, Gastonia, President; Dr. Eva M. Locke, White Rock, Vice-President, and Dr. L. V. Grady, Wilson, Secretary-Treasurer.

A $25,000 appropriation for a tuberculosis sanatorium for Wayne County has been approved by the Wayne County Board of Commissioners.

Dr. Thomas J. Sasser has been appointed School Physician in the Department of Health, Charlotte.

Dr. John D. MacRae, Asheville, announces that his son, Dr. J. D. MacRae, Jr., is now associated with him in the practice of x-ray and radium diagnosis and therapy.

The Clinic Hospital Staff, Greensboro, has appointed Dr. J. Henry Bayles as President and Dr. Casper W. Jennings as Secretary.

Onslow County Medical Society announces that every licensed physician in that County is a member of the Society.

The North Carolina State Society for the Control of Cancer has set aside the second week of October as Cancer Week and requests that each county medi-

(Continued on page 42)

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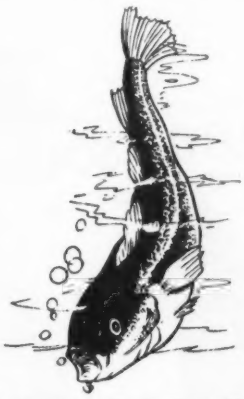
There is no substitute for cod liver oil, and it has been definitely established that its value does not depend upon the presence of one vitamin, but on the combination of Vitamins A and D.

Patch workers on the sea-going steam trawlers, in the shore plants, and in the laboratory are combined into a trained, experienced force that produces for you Patch's Flavored Cod Liver Oil, standardized as to Vitamin A and D potency, presenting this vitamin potency in safe and familiar dosage.

And, in addition, it is an unusually palatable product, which palatability we would like to demonstrate to you by sending you a sample.



Patch's Flavored Cod Liver Oil

The E. L. Patch Company
Boston, Mass.

The E. L. Patch Co.,
Stoneham 80, Dept. SM.10,
Boston, Mass.

Gentlemen: Please send me a sample of Patch's Flavored Cod Liver Oil and literature.

Dr.....

Address.....

BACILLUS ACIDOPHILUS CULTURE
(B. A. CULTURE)

PHYSICIANS who prescribe the Bacillus Acidophilus will readily appreciate the advantages of a culture in a convenient form and which is always acceptable to the patient.

BACILLUS ACIDOPHILUS CULTURE (B. A. CULTURE) is issued in 4-ounce bottles,—effective, convenient and economical. Its agreeable taste appeals to the patient at once.

B. B. Culture Laboratory, Inc.
Yonkers, New York

(Continued from page 40)

cal society form a committee to arrange to hold clinics.

Dr. Edmund Eugene Robinson, Concord, was married to Miss Mildred Eaves in June.

Dr. Paul Rutherford MacFayden, Jr., Concord, was married to Miss Martha Elizabeth Goodwin, Louisa, on August 3.

Dr. William T. Harris and Miss Sara Tomlinson, both of Troy, were married July 17.

Deaths

Dr. James Beal Angle, Ocracoke, aged 80, died June 16 of acute nephritis.

Dr. Joseph Richard Pope, Enfield, aged 80, died June 4 of heart disease.

Dr. W. A. Wakefield, Charlotte, aged 74, died August 12.

Dr. W. F. Crouse, Crouse, aged 40, died August 11 at Cocasola, Panama Canal Zone.

Dr. Hugh Brantley York, Williamston, died August 30 from a stroke of apoplexy which occurred August 18.

OKLAHOMA

The Harmon County Medical Society recently elected the following officers for the ensuing year: Dr. J. E. Jones, Hollis, President; Dr. W. T. Ray, Gould, Vice-President; and Dr. Russell Lynch, Hollis, Secretary-Treasurer.

Dr. Ray M. Balyeat, Oklahoma City, has been elected President of the American Society for the Study of Allergy.

Dr. Thomas M. Berry, Eldorado, has been appointed local surgeon for the Frisco Railroad.

Dr. G. O. Webb, Cardin, has been appointed to the Veterans' Bureau Staff at Knoxville, Tennessee, and has removed to that city.

Dr. Burleigh DeTar has removed from Miami to

(Continued on page 44)

PELTON STERILIZERS

Send the coupon below for complete data

Leadership

. . . born of consistent year after year trouble-free service . . . A leadership proved by the overwhelming preference of the past two and a half years —leadership undisputed.

There are good reasons for the widespread acceptance of the Pelton Thermatic Sterilizer . . . It is always ready to deliver any one of its three separate boiling speeds . . . The 3-speed Switch that controls them removes all element of human uncertainty, maintaining the desired boiling speed until current is disconnected . . . You can forget to turn it off—a positive control entirely separate from the 3-speed Switch does the job automatically . . . The Pelton boiler is a one-piece copper stamping. Positively no solder or rivets to loosen and create leakage.

Over 75,000 Pelton Sterilizers are in operation in doctor's offices today—surely you need no better recommendation.

THE PELTON & CRANE CO.
DETROIT, MICHIGAN

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The Plain Truth about Canned Vegetables

NUTRITIONISTS advocate a greater consumption of vegetables, because of their vitamin content, their mineral salts, their alkaline residue and the bulk and roughage they add to the diet.

BUT vegetables are seasonal and perishable. Peas, for example, held in pods for six days in a cool place, although still excellent in appearance were found to have lost much of their original vitamin content.

EXTENSIVE research has shown that most commercially canned vegetables are richer in vitamins than "so-called" fresh vegetables cooked at home. Home cooking in open vessels, it has been found, causes a large percentage of the vitamins to escape through oxidation.

STOKELY'S Vegetables are grown on our own farms. They are picked fresh and packed the same day, often within the same hour. The Stokely steam pressure closed vessel method seals the vitamins in the cans.

WE want physicians to learn first hand of their purity, wholesomeness and high vitamin content. To this end we have arranged to furnish, without cost, liberal samples of Stokely's Vegetables for clinical examination. Written request should be made on your professional letterhead.

STOKELY BROTHERS & CO., INC.
Heyburn Building, Louisville, Kentucky

Stokely's VEGETABLES

Green Beans	Corn	Sauerkraut	Turnip Greens
Lima Beans	Peas	and Juice	Honey Pod Peas
Pumpkin	Beets	Red Kidney	Peas and Carrots
Tomatoes	Carrots	Beans	(Mixed)
Tomato Puree	Hominy	Cranberry	Mixed
Chile Sauce	Catsup	Sauce	Vegetables

SAFE, SIMPLE INFANT FEEDING

HORLICK'S Malted Milk is safe and simple in infant feeding. Its successful use for nearly half a century has demonstrated the following outstanding advantages:

1 The readily assimilable state of its minerals promotes sound bone and tooth structure.

2 The light, flaky curds produced because of the modified nature of its milk constituent aid digestion.

3 The exact proportions of its malt sugars promote regular bowel action in the infant.

4 The exclusive Horlick process conserves the vitamin content of milk and malted grains unimpaired.

For samples address—HORLICK, Racine, Wis.

THE ORIGINAL MALTED MILK

HORLICK'S

(Continued from page 42)

Joplin, Missouri, where he will practice general surgery.

Dr. Tom DeArman has located in Miami, having recently finished his internship in Oklahoma City.

Dr. W. A. Sibley, Miami, has been put in charge of the Nervous and Mental Department of the Veterans' Bureau at Knoxville, Tennessee. Dr. Sibley has spent the last six months in Washington, D. C., taking special training in nervous and mental diseases.

Dr. J. L. Reynolds, Tulsa, announces the removal of his offices to the Mayo Building.

Dr. Frank Clinton Gallaher and Miss Maudie Bowles, both of Shawnee, were married July 17.

Dr. George A. DeTar and Mrs. Effie Boyd, both of Miami, were married June 1st.

Deaths

Dr. Wm. Gladstone Lemmon, Tulsa, aged 42, died July 4.

Dr. James A. Pryor, Shattuck, aged 66, died June 29 of heart disease.

SOUTH CAROLINA

Dr. W. B. Lyles, Spartanburg, was slightly injured July 22 in an automobile accident.

The U. S. Department of Commerce announces that the death rate for South Carolina in 1928 was 1,310.5 per hundred thousand population, compared with 1,173.3 in 1927. The estimated population on July 1, 1928, was 1,864,000. The rates were increased over those of the preceding year for heart disease, nephritis, cerebral hemorrhage, diabetes, cancer, influenza, pellagra, malaria and diphtheria; but the rate for tuberculosis, whooping cough, typhoid, meningitis and poliomyelitis was decreased.

Dr. Henry B. Stewart, Fountain Inn, celebrated his fiftieth year in the practice of medicine in April.

Dr. Leon Banov, Charleston, was recently elected

(Continued on page 46)

SEROBACTERINS

SENSITIZED BACTERIAL VACCINES

Provide forces (antibodies) to battle the invading bacteria of disease while the resistant powers of the body are becoming mobilized.

They also provide a degree of immediate protection to those exposed in time of epidemics.

They reduce the toxicity of the antigen, reducing both local and general reactions, thus allowing larger doses to be given.

Thus they save precious time when resistance is lowest and reinforcement vitally needed.

Serobacterins also induce a state of active immunity at least as high as that caused by plain bacterins.

ACNE SEROBACTERIN MIXED
CATARRH (COLD) SEROBACTERIN MIXED
INFLUENZA SEROBACTERIN MIXED
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STAPHYLO-STREPTO-SEROBACTERIN MIXED
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In syringes and 5 cc vials

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The Pioneer Biological Laboratories

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And Now — A Sterilizing Medium Non-Injurious to Bard-Parker Blades

It Sterilizes

BARD-PARKER formaldehyde GERMICIDE

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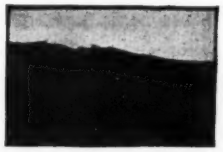


Edge of steel blade after boiling in water for five minutes.

Edge of steel blade after 36 hours in Bard-Parker formaldehyde Germicide.

Edge of steel blade before treatment.

A powerful, non-corrosive sterilizing medium of high germicidal efficiency, prepared especially for sterilizing Bard-Parker Knives and other fine surgical instruments.

Extensive laboratory tests indicate that Bard-Parker formaldehyde Germicide:

Destroys the most resisting non-spore-bearing bacteria in less than two minutes.

Destroys the most resisting spore-bearing bacteria in one and a half hours.

Will not injure the keen edge of Bard-Parker Blades or other fine steel instruments after two weeks constant immersion.

PRICES:

One-pint bottles . . .	$ 1.00 each
One carton (12 pints) . .	10.80
One-gallon bottles . . .	5.00 each
One carton (4-one gals.) .	18.00

Ask your dealer for circular giving complete description of Bard-Parker Germicide and Sterilizing Container. Detailed Laboratory Reports will be furnished upon request.

PARKER, WHITE & HEYL, INC.
369 Lexington Avenue, New York, N.Y.

JARCHO PRESSOMETER

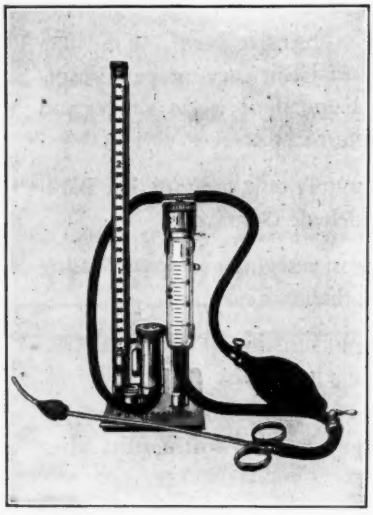
Suggested for Uterosalpingography

by

JULIUS JARCHO, M.D., F.A.C.S.

See Article by Dr. Jarcho

June 1929 issue American Journal of Surgery



This instrument provides for the determination of the patency or non-patency of Fallopian tubes. It is designed to facilitate the injection of iodized oil such as Lipiodol, Iodipin, Lipiodine, etc., or air or gas, at a definite pressure.

Since, in this device pressure is exerted between the manometer and the oil, contamination of the manometer or bulb and valves is effectively prevented. This is the only apparatus which operates in this manner.

Price complete in Walnut Case—$25.00

McKesson-Bedsole-Colvin-O'Dell, Inc.

Birmingham, Ala. **Mobile, Ala.**

(Continued from page 44)

President of the South Carolina Public Health Association for this year.

Dr. Beverly A. Henry, Anderson, has been elected President of the Chamber of Commerce of that city.

Dr. James A. Hayne, Secretary of the State Board of Health, reports that there was a large increase in the number of cases of pellagra in the State in 1929, but the mortality rate was considerably reduced. The number of cases for 1929 was 4,154, and for 1928, 2,902; the deaths from pellagra in 1929 were 422 and 1928, 326.

TENNESSEE

Dr. J. B. Naive, formerly at the Davidson County Tuberculosis Hospital, has been made Superintendent of the Beverly Hills Sanatoruim, Knoxville. Dr. R. R. Crowe succeeds Dr. Naive at the Davidson County Hospital.

Dr. R. S. Smylie, formerly of St. Louis, has located in Memphis.

Dr. John B. Shoun and Dr. Estill L. Caudill, Elizabethtown, have been appointed physicians to the American Bemberg and American Glanzstoff plants, succeeding the late Dr. John O. Woods.

Dr. Elkin L. Rippy, Nashville, has been named Resident Physician for the Nashville General Hospital.

Dr. Harley W. Qualls, Memphis, has been elected President of the State Board of Medical Examiners, succeeding Dr. William L. McCreary, Knoxville, resigned. Dr. James H. Keeling, Knoxvile, has been appointed a member of the Board.

Dr. Avery Leeper, Lenoir City, is now associated with his father, Dr. J. T. Leeper.

Dr. O. H. Adkins, formerly of Cumberland City, has removed to Erin.

Dr. J. Q. Owsley, Jr., is visiting his father, Dr. J. Q. Owsley, Sr., Nashville. Dr. Owsley, Jr., has just completed a term of foreign service with the Asiatic Squadron and will report to New York very soon for a term in the Naval Hospital.

(Continued on page 48)

CLASSIFIED ADVERTISEMENTS

FOR SALE—Twenty-bed tuberculosis sanatorium in a large Southwestern health resort. Up-and-coming town. Can be used for general hospital. Excellent opening for one here. At small expense can be made into fifty-bed hospital. Good opportunity for physician to run sanatorium and recover health. Reasonable price. Write P. D. E., care Journal.

WANTED—Position by competent woman x-ray technician. South preferred. Address C. K., care Southern Medical Journal.

TECHNICIANS are in demand. We are successfully training laboratory and x-ray workers. Send us your assistant and we will return you a competent technician. If you are in immediate need of a well trained helper, write or phone. Full information upon request. Alabama Pathological Laboratory, Birmingham General Hospital, Birmingham, Ala.

LITERARY ASSISTANCE on special medical subjects for busy physicians. We promptly develop any subject of popular or technical interest from the latest authorities, using the unlimited facilities available here. Reasonable rates; correspondence confidential. We also edit, revise and enlarge physicians' manuscripts. Authors' Research Bureau, 500 Fifth Avenue, New York, New York.

DRUG AND ALCOHOLIC PATIENTS are humanely and successfully treated in Glenwood Park Sanitarium, Greensboro, N. C.; reprints of articles mailed upon request. Address W. C. Ashworth, M.D., Owner, Greensboro, N. C.

Revolutionizing the Treatment of Malaria!

PLASMOCHIN
TRADE MARK REG. U.S. PAT. OFF.
BRAND OF
AMINOQUIN
COMPOUND

EXHAUSTIVE investigations in all parts of the world have furnished convincing evidence that Plasmochin rapidly destroys the malarial parasites in the blood. It exerts an especially powerful action upon the gametes, which are responsible for the transmission of malaria and are highly resistant to quinin. Therefore, Plasmochin is destined to play an important part in the eradication of malaria.

Plasmochin Compound—a combination with quinin—has been shown to control the clinical symptoms (chills, fever, splenic enlargement), speedily and dependably. Relapses are of far less frequent occurrence than under the customary treatment.

The administration of Plasmochin Compound several times weekly has proved an efficient prophylactic measure in malarial districts.

Plasmochin Compound is supplied in bottles of 50 tablets

Dose: *Adults,* two tablets, 3 times daily; *children,* from 1 to 5 years, one tablet, once or twice daily; *older children,* one tablet, 3 or 4 times daily.

Pamphlet sent to physicians on request

WINTHROP

WINTHROP CHEMICAL COMPANY, Inc.
117 HUDSON STREET NEW YORK, N. Y.

The results of twenty years' clinical experience in the foremost medical centers of this country, are your precedent for prescribing

OLEO-GOMENOL

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CYSTITIS

℞ 5 to 15cc, by injection direct into the bladder.

C. R. BARD, Inc.

Exclusive Agents in the United States

79 Madison Ave. New York, N. Y.

(Continued from page 46)

Dr. I. L. McGinnes has moved to Pikeville, where he will practice medicine.

Dr. A. P. Harrison, after an absence of ten years, has returned to Loudon to practice.

Dr. Wm. Preas is now associated with his father, Dr. J. H. Preas, in Johnson City.

Dr. W. S. Cooper has returned to Oneida to practice after living several months in Kentucky.

Deaths

Dr. William Compton, Nashville, aged 82, died July 7 of heart disease.

Dr. John David Weaver, Knoxville, aged 59, died July 11 of injuries received in an automobile accident in November.

TEXAS

At their meeting in July the Southwest Texas District Society elected the following officers: Dr. W. T. Robertson, Kingsville, President; Dr. A. G. Cowles, San Antonio, Vice-President, and Dr. J. L. Pipkin, San Antonio, Secretary-Treasurer. Their next meeting will be in San Antonio in January, 1930.

Dr. W. E. Herrin, Dallas, Texas, announces the removal of his offices from Medical Arts Building to 5527 Columbia Avenue.

A modern hospital will be located on the top floor of the Medical-Professional Building at Corpus Christi, and will cost between $20,000 and $30,000.

Dr. C. C. Shotts, Poteet, is constructing a modern hospital in that City. It will contain 14 rooms and will be fireproof, with all modern conveniences.

Dr. T. E. Standifer's new hospital at Turkey was formally opened June 8. This hospital cost $30,000 and is fully equipped, with 15 beds for patients.

Dr. W. R. Thompson, Fort Worth, entertained the Fort Worth Eye, Ear, Nose and Throat Society with a dinner at the River Crest Country Club, preceding

(Continued on page 50)

TWO MALTBIE ACHIEVEMENTS

Calcreose
Compound Syrup of Calcreose
A tasty, effective creosote cough syrup that does not nauseate.
Tablets Calcreose 4 grains
Full creosote medication in a form which patients will tolerate.

which meet your therapeutic requirements!

CLINICAL experience during influenza epidemics demonstrated that Calcreose was of value in the treatment of pulmonary and intestinal complications.

The Tablets Calcreose 4 grs. contain 2 grs. of pure creosote combined with hydrated calcium oxide.

Each fluid ounce of Compound Syrup of Calcreose represents Calcreose Solution 160 minims (equivalent to 10 minims of pure creosote); Alcohol, 24 minims; Chloroform, approximately 3 minims; Wild Cherry Bark, 20 grains; Peppermint, Aromatics and Syrup q. s.

The MALTBIE Chemical Company, Newark, New Jersey.

MALTBIE Calcreose

Sooner or later

That baby must be weaned!

"The fact confronts us that the mother who has enough milk for her baby till the fifth or sixth month is in the great minority."

JOSEPH BRENNEMAN, M.D., *Abt's "Pediatrics"*, Vol. 2.

Dryco-fed infants progress from breast to bottle feedings without the digestive and nutritional disturbances often attendant upon weaning. Their characteristically healthy color is maintained and normal gains in weight continue without interruption. These facts, proved by many years of clinical history, recommend Dryco for your consideration. - - -

Upon ingestion, Dryco forms small flocculent particles, presenting a wide area of attack for the gastric juices and assuring maximum results with minimum digestive effort. It is well borne in even the most difficult feeding cases. Free from pathogenic bacteria, the use of Dryco avoids the danger milk-borne infections. This fact, together with its simplicity of preparation, are further contributory reasons why physicians all over the world consider it the ideal milk for infants deprived of breast feeding.

Send for suggested feeding tables, Dryco samples and clinical data!

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For convenience, pin this to your letterhead or Rx blank and mail

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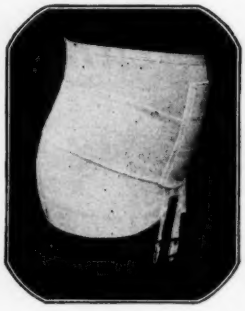
"A word fitly spoken—how good!"
This word came yesterday from a distinguished M.D.
—"The Storm has been tried and proven."

"STORM"



The New "Type N" Storm Supporter

meets demands of present styles in dress.

Long special laced back Extension of soft material low on hips.

Hose supporters attached.

Takes Place of Corsets

Adaptable to Pregnancy, Ptosis, Hernia, Obesity, Sacro-Iliac Relaxation, High and Low Operations, etc.

Ask for Literature

Each belt made to order in 24 hours

KATHERINE L. STORM, M.D.
Originator, Owner and Maker
1701 Diamond Street Philadelphia

(Continued from page 48)

a clinic which was held in the Auditorium of the Tarrant County Medical Society.

Big Spring and Howard Counties are planning a County Heath Unit which will be composed of a full time health doctor, nurse, sanitary inspector and a stenographer. The Rockefeller Institute will aid in the health program and funds will be available from that source on October 1.

Dr. James M. Gorman, El Paso, was married to Miss Nell Mariam Smith, El Paso, on June 29.

Dr. Rufus Roberts, Decatur, and Miss Willa Mae Warden, McKinney, were married June 26.

Deaths

Dr. Gideon H. Huddle, Dallas, aged 62, died June 20, of cerebral hemorrhage and arteriosclerosis.

Dr. William A. Burns, Moran, aged 39, died July 4 of perforated gastric ulcer and abscess of the liver.

Dr. Roy L. Keller, Dallas, aged 33, was instantly killed in an automobile collision on July 4.

Dr. James Henry Womack, Waco, aged 57, died June 29 of encephalitis.

Dr. John Henry Dean, Dallas, aged 50, died July 25 of myocarditis.

VIRGINIA

Miss Frances Helen Zeigler, R. N., former Educational Director and Assistant Director of Nurses, School of Nursing and Health, University of Cincinnati, has been appointed Dean of the School of Nursing and Director of Nursing Service of college hospitals at the Medical College of Virginia, Richmond. Miss Zeigler is an alumnus of Virginia Intermont College, Johns Hopkins Hospital School of Nursing and Teachers College, Columbia University. She assumed her duties on September 1.

The Medical College of Virginia, Richmond, announces the following new appointments to the faculty of medicine: Dr. Garrett Dalton, Instructor in Obstet-

(Continued on page 54)

Two Therapeutic Requirements

Such authorities as Palmer have stressed the importance of liberal amounts of water together with alkali administration in the treatment of alkali depletion.

The clinical success of Kalak Water depends upon the fact that it presents a mixture of those elements needed for maintaining the alkali reserve in a form which ensures a liberal fluid intake.

Besides 1.0326 grams of Disodium phosphate, Sodium chloride and Potassium chloride, each liter carries a total of 6.6648 grams of the bicarbonates of Calcium, Magnesium, Sodium and Potassium.

Kalak Water is the strongest alkaline water of commerce.

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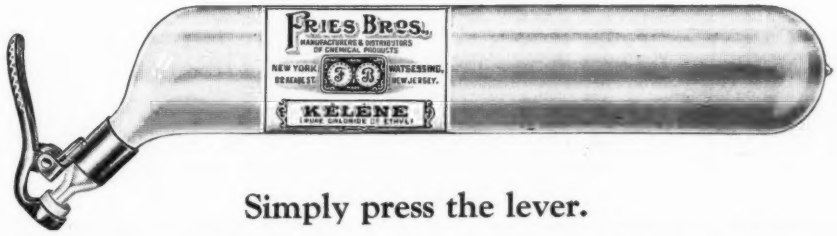
For Local and General Anesthesia

KELENE

PURE ETHYL CHLORIDE



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10 Gm., 30 Gm. and 60 Gm. Automatic Closing Tubes.
3 Cc. and 5 Cc. Hermetically Sealed Tubes.

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These laboratories are equipped for making every test of clinical value in the diagnostic study of medical and surgical cases. Only standardized methods and technique are used.

In addition to the diagnostic study of cases there are adequate facilities for the x-ray and radium treatment of conditions in which these forms of treatment are indicated.

Containers for pathological specimens and information in reference to x-ray and radium work furnished upon request.

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USE ONLY ON ORDER AND UNDER SUPERVISION OF A LICENSED PHYSICIAN HE WILL GIVE YOU INSTRUCTIONS
APPROXIMATE ANALYSIS

FEATURES OF S. M. A.

❖ Only milk from tuberculin tested cows is used as a basis for the production of S. M. A. ❖ ❖ No modification is necessary for normal full term infants. ❖ ❖ Prevents rickets and spasmophilia. ❖ ❖ It gives excellent nutritional results in most cases ❖ in addition these results are obtained more simply and more quickly. ❖ ❖ Simple for the mother to prepare. ❖ It resembles breast milk ❖ both physically and chemically. ❖ ❖ Developed at the Babies and Childrens Hospital of Cleveland. ❖ ❖ Produced by its permission exclusively by The Laboratory Products Company. ❖ ❖ ❖

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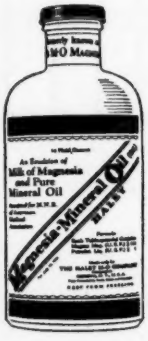
Magnesia-Mineral Oil (25)
HALEY

Accepted for N. N. R. of the A. M. A. formerly Haley's M-O Magnesia Oil

Mild in action, does not disturb digestion, does not "wear out." Professional evidence obtained by questionnaire suggests its use in Gastro Intestinal Hyperacidity, Gastric and Duodenal Ulcer, Intestinal Stasis, Constipation, Autotoxemia, Colitis, Hemorrhoids. Also before and after operation, during Pregnancy and Maternity, in infancy, childhood and old age.



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An effective Antacid Mouth Wash

Generous sample and literature to any physician on request

The
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(Continued from page 50)

rics; Dr. J. B. Dalton, Instructor in Orthopedic Surgery; Dr. John R. Ellison, Jr., Assistant in Surgery; Dr. J. Arthur Gallant, Assistant in Medicine; Dr. Oscar L. Hite, Assistant in Nervous and Mental Diseases; Dr. Paul W. Howle, Associate in Surgery; Everett H. Ingersoll, Associate in Anatomy; W. A. Peabody, Ph.D., Associate in Chemistry; Dr. John H. Reed, Jr., Assistant in Surgery, and Dr. Earle L. Shamblen, Assistant in Surgery.

Dr. Charles R. Robins, Richmond, was presented with a set of silver by the Richmond Rotary Club in appreciation of his services as President for the past year.

Dr. George S. Silliman, Abingdon, has removed to Gary, Indiana, where he has accepted a position as Roentgenologist and Pathologist at the Methodist Hospital in that City.

The University of Virginia held its fifth institute for doctors' helpers in August. The purpose of the institute is to teach women some of the elementary principles of nursing which will qualify them to act as bedside helpers when trained nurses are not absolutely necessary or available. The courses are designed so they will be especially helpful in confinement cases and will, in a measure, supplant the ignorant midwife. A similar institute for colored women was also held in Petersburg at the Virginia Normal and Industrial School.

Dr. E. Newton Pleasants, formerly of Princeton, West Virginia, has moved to Richmond and is associated with Dr. Alexander G. Brown, Jr., in the practice of internal medicine.

The Virginia Society of Oto-Laryngology and Ophthalmology recently held a meeting and elected the following officers for 1930: Dr. H. B. Stone, Roanoke, President; Dr. Frank Smart, Norfolk, Vice-President, and Dr. Fletcher D. Woodward, University, Secretary-Treasurer (re-elected). The Executive Committee is composed of Dr. Clifton M. Miller, Richmond;

(Continued on page 56)

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(Continued from page 54)

Dr. C. S. Dodd, Petersburg, and Dr. Frank M. Hanger, Staunton. At this meeting the Society adopted the Virginia Medical Monthly as its official organ, and Roanoke was chosen as the meeting place for 1930.

Dr. Archer A. Wilson, formerly of Switchback, West Virginia, has moved to Richmond to become Resident in Neuro-Surgery of the Memorial and Allied Hospitals.

Dr. Emory Hill, Richmond, was recently re-elected Secretary of the American Ophthalmological Society.

Dr. J. R. Grinels has become associated with Dr. Thomas Wheeldon, Richmond, as Assistant in Orthopedic Surgery.

A local unit of the Gorgas Health Corps, Petersburg, was recently organized with the following physicians as members: Dr. J. Bolling Jones, Dr. Robt. A. Martin, Dr. J. M. Harwood, Dr. Wm. A. Reese, Dr. Wright Clarkson, and Dr. Mason Romaine.

The Bedford County Medical Society was recently entertained at dinner by Dr. G. E. Heller, after which an election of officers was held. The druggists and dentists of the County were made auxiliary members of the Society. The following are the officers elected: Dr. T. P. West, Bedford, President; Dr. M. W. Gibbs, Bellevue, Vice-President, and Dr. R. A. Bennett, Bedford, Secretary.

Dr. Robert C. Bryan, Richmond, has become a member of the staff of the Stuart Circle Hospital Corporation, since disposing of his interest in Grace Hospital. He also has offices in the Prestwould Apartments. Dr. R. L. Creekmur is still associated with Dr. Bryan.

The Madison County Chamber of Commerce, Madison, recently elected Dr. J. N. Clore, Madison, President, and Dr. C. F. Ross and Dr. W. L. Early, Wolftown, Vice-Presidents.

Dr. D. S. Divers, Pulaski, was recently elected Vice-President of the Pulaski County Club.

Dr. D. Lane Elder, Hopewell, has been appointed Local Surgeon for the Seaboard Air Line Railway.

Dr. Leroy A. Calkins, Richmond, has resigned as

(Continued on page 58)

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(Continued from page 56)

Professor of Obstetrics and Gynecology at the University of Virginia, to accept a similar position in the University of Kansas Medical School, Kansas City.

Dr. Edwin L. McQuade, formerly Health Officer of Henrico County, has accepted a position as Instructor in Epidemiology at Johns Hopkins University School of Medicine, Baltimore.

Dr. Harry Walker, Courtland, has been appointed Health Officer for Fairfax County.

Dr. Ford K. Lucas, who has just completed an internship at Roanoke Hospital, Roanoke, has located at Blacksburg.

Dr. Barton B. McCluer, Speedwell, has removed to Bon Air.

Dr. George H. Davis and Dr. M. B. Hiden, Warrenton, have been elected as Directors of the Warrenton Chamber of Commerce.

The Virginia Hospital Association will meet in Charlottesville on October 22.

The Medical Society of Virginia will hold its annual meeting in Charlottesville, October 22-24.

Dr. Emerson Macaulay Babb, Ivor, was married to Miss Virginia Bell Smith, Franklin, on June 25.

Dr. Chapman Hunter Binford, Pamplin, was married to Miss Thelma Lynette Beauchamp, Rainswood, on June 8.

Dr. Jack Smiley, Salem, and Miss Mary Frances, Duke, were married April 19.

Dr. Francis Bailey Teague, Roanoke, and Miss Doris Evalene Ferrell, Lynchburg, were married June 8.

Dr. John Powell Williams and Mrs. Virginia Marshall Gregory, both of Richmond, were married July 15.

Dr. Joseph J. Anderson and Miss Laura Temple Drudge, both of Richmond, were married July 6.

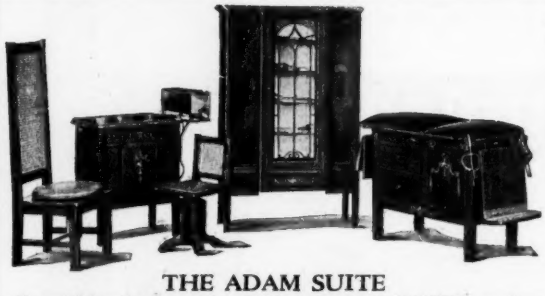
Dr. Lacey S. Wornal and Miss Corrine Amanda Snow, both of Richmond, were married June 26.

Deaths

Dr. Charles L. Bailey, Sandston, aged 52, died August 1.

Dr. R. Lester Hudgins, Farmville, aged 50, died July 1 of agranulocytic angina.

(Continued on page 60)



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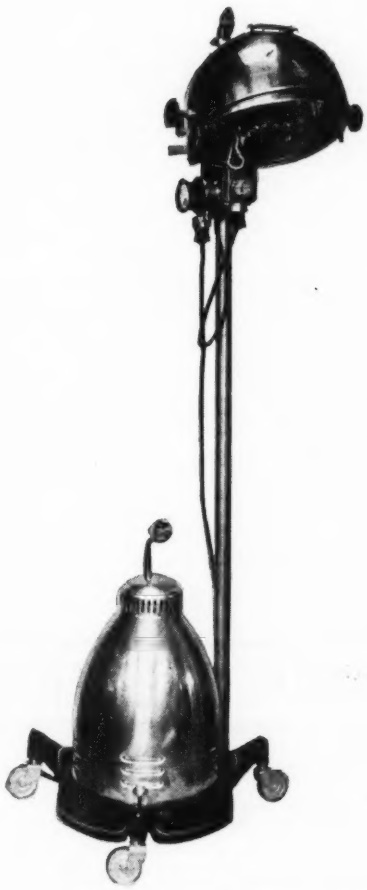

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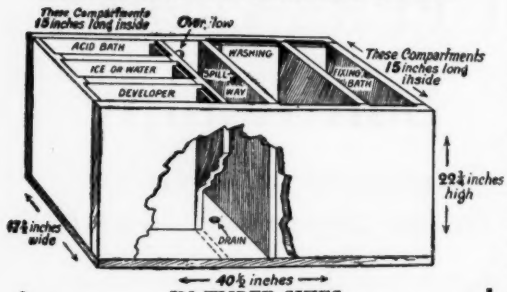

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(Continued from page 58)

WEST VIRGINIA

Dr. A. E. Murphy, St. Marys, has been appointed Director of the Raleigh County Health Unit, succeeding Dr. J. S. Maxwell, who resigned to take up medical work in Africa. Dr. Murphy was formerly with the Rockefeller Foundation.

Dr. A. R. Lutz, Charleston, has been appointed Assistant Surgeon to the Welch Hospital No. 1, Welch, taking up his new duties on July 1.

Dr. L. E. Walton, Pullman, has moved to New Market, Virginia, to practice.

Dr. Frank F. Sowers, Mannington, has been appointed Health Officer for Marion County. Dr. Sowers took the special course in public health work at the Rockefeller Foundation Training School, Indianola, Mississippi.

Dr. Howard M. Batson, Mannington, former Health Officer for Marion County, has gone to New Mexico to locate.

The West Virginia State Medical Association has just purchased a new, up-to-date moving picture machine for the use of all county societies that desire to show the Stuckert film on obstetricts at their meetings during the year.

The total mortality for the State in 1928 was 17,511. Accidents still held the lead in causes of death in 1928, with heart disease second, pneumonia third, diseases of early infancy fourth, tuberculosis fifth, influenza sixth, and nephritis and cancer running close for seventh place.

Dr. Homer Browning Luttrell, Bramwell, and Miss Virginia Painter, Pulaski, Virginia, were married July 6.

Deaths

Dr. Charles O'Grady, Charleston, aged 60, died July 31, following an operation.

Dr. Ambler Baxter Patton, White Sulphur Springs, aged 43, died July 8.

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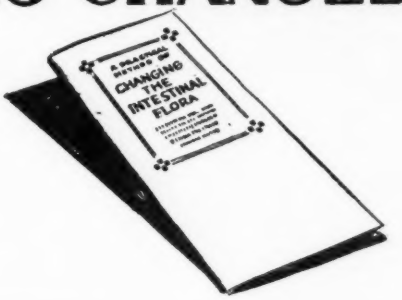

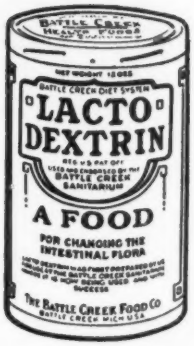

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